The CHEMIST

MAY, 1937 VOLUME XIV, NO. 5

AMERICAN INSTITUTE OF CHEMISTS

ANNUAL MEETING

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The CHEMIST

Publication of

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THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
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Medal of The American Institute of Chemists

"For noteworthy and outstanding service to the science of chemistry or the profession of chemist in America."

Awarded for 1937 to

JAMES F. NORRIS

Past Medalists

1926 William Blum
1927 Lafayette B. Mendel
1929 Mr. and Mrs. Francis Patrick Garvan
1930 George Eastman
1931 Andrew W. and Richard B. Mellon
1932 Charles H. Herty
1933 Henry C. Sherman
1934 James Bryant Conant
1936 Marston Taylor Bogert

Medal Award — 1937

The medal of THE AMERICAN INSTITUTE OF CHEMISTS was awarded this year to Dr. James F. Norris, professor of organic chemistry at Massachusetts Institute of Technology, in recognition of his outstanding service as a teacher and as an investigator in the field of organic chemistry. The medal was presented to Dr. Norris at the annual banquet held at The Chemists' Club, New York, N. Y., on May fifteenth. Dr. Maximilian Toch presided and introduced Dr. Marston Taylor Bogert, F.A.I.C., as "the greatest receiver and greatest giver of medals."

Dr. Bogert expressed his pleasure at being selected to present the INSTITUTE medal to one of his dearest friends. "As a fellow-teacher," he said, "I would like to bear my tribute to Professor Norris, a really great teacher. He realizes that the prominent thing in education is to develop men who shall be great leaders and courageous citizens. Next to that is the development in the student of the divine spark of inspiration. The factual foundation must take subordinate position to these two qualities."

At the conclusion of his remarks, Dr. Bogert presented the medal to Dr. Norris, with this citation:

> "It's the human touch in the world that counts,
> The touch of your hand in mine,
> Which means far more to a fainting heart
> Than shelter or bread or wine.
>
> "The shelter is gone when the night is o'er,
> And bread lasts only a day;
> But the touch of your hand,
> The sound of your voice
> Sing on in the heart alway."

Professor Norris discussed in his address the training of men who are to enter the profession of chemistry. Since the medal was awarded for "outstanding service as a teacher and investigator in the field of organic chemistry", it seemed appropriate to consider the importance of the influence of the teacher in the development of the student. Many medals are given to scientists who have accomplished outstanding research, and research has been repeatedly considered from many points of view. The successful teacher is usually overlooked and receives

little credit for his work. The tendency is growing in universities to overemphasize productive research at the expense of teaching, which is, in the final analysis, the chief business of a university. The aims of THE AMERICAN INSTITUTE OF CHEMISTS and the broad principles under which the medal is bestowed give the opportunity to a teacher to defend and praise his profession.

The duty of the teacher is first of all to arouse interest so that the student reads and studies far beyond the limits of his formal instruction. The teacher should guide and assist the student in developing those qualities that lead to success in his profession; resourcefulness, initiative, the ability to coöperate with others, and the power to express the result of his work in a convincing way. The speaker stated that he had never been asked by a prospective employer as to the scholarship grades of a student.

The ability to reproduce in an examination the facts presented in the lecture room is of secondary importance when the real business of life begins. Professor Norris related some of his experiences in high school and college and showed how his determination to become a chemist was the result of the inspiration of one of the greatest teachers of chemistry America has produced—the late Professor Ira Remsen of Johns Hopkins University.

The major part of the address was devoted to the problems met in the training of chemists. The necessity of study by the teacher of the success or failure of his methods was stressed. The result should not be blamed on the student alone.

Dr. Tenney L. Davis, professor at Massachusetts Institute of Technology, spoke on "The Medalist."

The Medalist

by Tenney L. Davis

THIS evening Professor Norris is awarded the medal of THE AMERICAN INSTITUTE OF CHEMISTS "in recognition of his outstanding service as a teacher and as an investigator in the field of organic chemistry", for the reason that this service has contributed to the advancement of chemistry, which is to say that it has increased our understanding of chemical phenomena, and for the reason that it has advanced the profession of chemist by educating men and women who have gone into that profession. Both points require amplification. Professor Norris has advanced the profession of chemist also in other

ways, as I shall presently relate, but in every way it has been by means of his infectious enthusiasm for the science.

Research and teaching are fine arts, undertakings of which no simple and universal account can be given, their methods determined from moment to moment by the sagacity and intuition of the person who practices them. Rules may be set down for painting a picture, for mixing the paints, for contriving the shadows, rules of artistry but not of art—for no rule can be given which will make over a good craftsman, even a perfect craftsman, into a great artist. And so it is with teaching and research. There are rules for the crafts but no rules for their successful practice. The truest philosopher, says Rabelais, and by philosopher he means a natural philosopher or scientific investigator, is a dog who is gnawing at a marrow bone. He knows how to proceed and how to get into the matter. He is also hungry for the marrow. The scientific investigator likewise is actuated by an impelling urge, a desire to find out. It has been said that every good teacher is a showman, and the saying is undoubtedly true as far as it goes and in a deeper sense than is at first apparent. The teacher must present his subject clearly, carefully and well; he must explain, elucidate, and clarify. The showman may exhibit his goods, the teacher may teach till the cows come home, but nothing happens until the customer decides to react, until the student decides to learn. The teacher shows, and however skillful he may be, it remains a fact that the student learns or not according to his own decision and inclination. The truly successful teacher must coerce or persuade the inclination of the student in this respect. If he arouses the student's interest, that helps; if he imparts an infectious enthusiasm for the understanding of the subject he gives the student something that never leaves him and evokes that evaluating judgment by which an educated person differs from one who is merely informed.

Professor Norris is a successful teacher and investigator. He teaches the art of research by the method of doing it, in such a way that his students wish to understand and to find out too; he has turned up many facts of organic chemistry which are of use to industry, and many facts and generalizations — insights and understanding viewpoints — which are of interest to science. As a teacher, he has done more than impart a knowledge of facts and theories. His students have acquired through contact with him an ease and familiarity with organic chemistry, an intuitive apprehension of the sorts of things that are likely, a sympathy with the preferences of organic molecules,

with the result that they have themselves become eager and skillful practitioners of the art. Professor Norris has directed the researches of many graduate students who now occupy important positions in teaching and in industry.

Professor Norris secured his own Ph.D. degree from Johns Hopkins University in 1895, where, under the direction of Ira Remsen, he had carried out researches on the action of the halogens on the alkyl amines. He was a member of the staff of the Chemistry Department of the Massachusetts Institute of Technology from 1895 to 1903, when he took on the duties of the first professor of organic chemistry at Simmons College in Boston, a newly organized college for women which was at that time just opening. Here he outfitted the laboratories, organized a course in chemistry, and had general supervision of all courses in science. While at Simmons he wrote his well-known text-books of Inorganic and Organic Chemistry, wrote them during the summers without recourse to reference books of any kind except tables of physical constants, for he believed that nothing ought to be included in the general text which a chemist does not remember because he finds it useful. The books in consequence hang together, and students find them easy to study. Except for a year of sabbatical leave, 1910-1911, Professor Norris stayed at Simmons until 1915, then at Vanderbilt University in Tennessee, then the war, then back again at Tech where he is now professor of organic chemistry and has been director of the Research Laboratory of Organic Chemistry since its organization in 1926. He has also given courses at Harvard, Radcliffe, Clark, and Bowdoin. During his first period at Tech, he gave among other courses one in the history of chemistry, having caught the contagion of that subject from Remsen. During his years as a teacher, he has taught at various times advanced organic and advanced inorganic chemistry, industrial chemistry, qualitative analysis, physical chemistry, food analysis, in fact chemistry of all sorts except quantitative analysis.

Professor Norris' first independent researches were in inorganic chemistry, on compounds of selenium and tellurium. His determination of the atomic weight of tellurium was for twenty years accepted as the best, but his figure for the atomic weight has now been superseded by one which is about one-tenth of a unit larger. His early interest in quantitative methods has endured in his more recent researches. His paper in 1907 on "The Base-forming Properties of

Carbon" was the first of a series in which facts of great interest and importance are described. Having discovered that tritolyl carbinol forms a sulfate which is soluble in water, can be electrolyzed, and has all the properties of a salt, he was led to try the effect of aqueous solutions of mineral acids on tertiary alcohols of the aliphatic series and later on primary and secondary alcohols. A simple method was developed which is undoubtedly the best known method for the preparation of alkyl halides. His interest in the effect of substituent groups upon the reactivity of the alcoholic hydroxyl has continued and some of his most recent researches, using exact physico-chemical methods, have elucidated the matter. Being convinced of the great usefulness of physico-chemical methods to the organic chemist, Professor Norris spent a sabbatical year, 1910-1911, at Karlsruhe in the laboratory of Fritz Haber, where he acquired ideas which he has since applied in a number of investigations. Another important series of his researches are those on organic molecular compounds, 1916, 1920, etc., which added to the evidence in favor of the notion of residual valence and confirmed the validity of the concept. A paper on "The Condensation of Benzoyl Chloride with Ethylene" in 1920, which constituted one of a series of papers on the mechanism of the Friedel-Crafts reaction, showed definitely that the hydrogen atom of ethylene comported itself in this reaction in the same manner as a hydrogen attached to an aromatic nucleus. His present researches concern the mechanism of reactions and the effect of groups upon reactivity and upon the ease of thermal decomposition. Many of them have involved exact physico-chemical measurements. The inferences to be derived from his work are such that they give the organic chemist an increased power over the molecules with which he works, because they give him a fuller familiarity with their habits.

Professor Norris has occasionally been called upon to testify in court in litigation over chemical patents. He has been an advisor and consultant to a number of organic chemical industries, a liaison officer between science and industry, bringing to the university laboratory an awareness of the problems which confront the manufacturer and taking to the manufacturer the latest findings of pure science.

In addition to Professor Norris' work as a teacher and as an investigator, he has also done much of what might be called public service for the science of chemistry and for the profession of chemist. For example, when the American Chemical Society established divisions

devoted to the several special branches, Professor Norris was the first chairman of the Division of Organic Chemistry. He was an early president of the New England Association of Chemistry Teachers, an organization from which the Division of Chemical Education of the American Chemical Society, the *Journal of Chemical Education*, and, indeed, the whole movement from which the present activity and improvement in chemical education in this country may be said to have sprung. In the early days of the war, 1917-1918, he was in charge of chemical research on agents of offense, War Gas Investigations, U. S. Bureau of Mines; later, as Lieutenant Colonel, he was in charge of the U. S. Chemical Warfare Service, in England. For ten years he served as vice-chairman and chairman (1924-1925) of the Division of Chemistry and Chemical Technology of the National Research Council and as member of the Executive Board of the Council. He was president of the American Chemical Society for two years, 1925 and 1926, and was able to procure funds for the Society by which its publications were improved and their usefulness to chemists throughout the world was increased. He was vice-president of the International Union of Pure and Applied Chemistry for four years, 1925-1928. At present, he is the first President of the Boston Professional Chapter of Alpha Chi Sigma. Truly he has devoted much time and energy to a sort of public service for the benefit of chemists, to a work which is neither teaching nor research but is dedicated to the advancement of the profession of chemistry wherever it is practiced.

Educational Positions Wanted

Two members of the teaching profession, of several years' experience, desire a change. Both hold the degree of Ph.D. One has taught physical, inorganic, and organic; the other only organic. Both have publications to their credit and both have directed research. One is a Fellow of The American Institute of Chemists. Dissatisfaction with present locations is not a factor in the desire for a change on the part of either. Correspondence would be welcomed with any educational institution desiring to discuss the possibility of an opening. Address replies to Box 14, THE CHEMIST, 233 Broadway, New York, N. Y.

Student Medals

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The Year in Review

This issue of THE CHEMIST summarizes the work of THE AMERICAN INSTITUTE OF CHEMISTS during the fiscal year, 1936-1937, a year of encouraging progress which has strengthened the foundation for greater accomplishment in the future. The INSTITUTE's committees are already hard at work preparing for the fall activities.

THE CHEMIST will not appear again until September, 1937. In the meantime, we wish you a pleasant vacation.

The Consulting Chemist

by **William M. Grosvenor, F.A.I.C.**

President, William M. Grosvenor Laboratories

IN RECENT years, there has been in England much talk about the passing of the "Consulting Chemist". Some of our British cousins have contended that, to be qualified as a consulting chemist, a man should have passed the examinations of the Institution of Chemical Engineers. The consulting chemist has been said to be a vanishing, if not an already vanished, species. Over here, funny questions have been asked, such as "Where is it?", "Gone With The Wind?", "Extinct with the dodo?". Some have even gone so far as to ask "Just *what* is it?" or, "Was there really any such thing, or was it a mere figment of the imagination—just a passing dream?". In view of the trend of these questions, it is perhaps most fitting that the subject be discussed by an antiquated old specimen of the animal in question, for that's what it really was—a real animal, and not a mere unorganized assemblage of wind, water, and imagination, as implied by the funny questions.

However, you must make allowances for some of the characteristics of the animal. One of these was an early knowledge and the practical use of what has recently been claimed and much advertised as a new discovery, the "Uncertainty Principle". Perhaps it was instinct, perhaps a rudimentary form of intelligence which led those animals to certain reactions which now seem to be in danger of becoming extinct in the remaining species of the *genus homo*. One such reaction which seems difficult for present mankind to understand was an urge, before making these noises which were its more or less rudimentary forms of speech, to find out just what it was trying to "talk" about. So it was instinctive and natural, before discussing with you the "Consulting Chemist" to make some effort to determine what it was we were to discuss.

One of the early tomes in your Chemists' Library was published sometime before the complete debacle of the ancient civilization. To be exact, in the old time-system it appeared in the year 1926; in present parlance it would be called six milleniums B.R. You see it was really an antediluvian book. That tome defines a "chemist" as "one *versed* in the science which treats of the composition of substances and of the transformations which they undergo". This tells us that the chemist

was merely expected to be "versed in chemistry"—not to know it all, or even all about any part of it. "Versed" is defined as "acquainted with, practiced in, or skilled in"; for example, in that science. The somewhat limited and modest rôle thus assigned to a man who plays the part of a "Consulting Chemist" is entirely confirmed by the meaning of the word *consulting*. The same ancient work defines "consult" as "to seek the advice of another; to take counsel, to deliberate together, to confer". All that this man who has a speaking acquaintance with chemistry is really called upon to do as a consultant is "to seek the advice" of another, who may be his employer or his employer's employees; "to take counsel with" him and them; "to deliberate together", or "confer with" them and him. Sometimes that is really all he does do. Yet his conferences may be highly valuable and joyfully well paid for.

You see in those obsolete days it was believed that wisdom was something essentially different from, and much more rare than, mere observation and storage in the mental attic of pretty pictures in more or less orderly array. It was something quite different from, though it might include, beautiful ideals of what things and events ought to be, and how they ought to be related to one another. Wisdom was not in those older days regarded as the ability to "tell the world" loudly all about what to do and how to do it; to be a prophet regardless of facts before and consequences afterward. Wisdom then meant the ability to discern and judge soundly between the true and the false. In fact, in the dear dead days beyond recall, it was assumed that the chemists did *not* know it all—that nobody did, even though there was much less to be learned then than now. This does not at all imply that one must be able to pass the examinations of the British Institute of Chemical Engineers in order to qualify as a consultant, as some of our English professional brethren seem to think. It would, of course, be admirable if he could do that too, without having ruined his common sense and neglected many other things more important (at least to a consultant) than preparation for exams.

In connection with tracing the origin and development of inventions made or initiated by consultants, it happens to have been my privilege to review the records of, or to watch, a number of such consultations. In the majority of them the consultant was not a remarkable chemist, an exceptionally good engineer, nor did he know at first any more than I, or nearly as much as some others about the detail of his client's problems. But, as a rule, he certainly could ask plenty of questions

and they were clear, logical and pointed. Also he could think straight, and simply. He avoided being confused among a multitude of possibilities and theories and had no profound reverence for them *per se*—least of all for his own.

If a man is to become a valuable consultant, in chemistry or any other line, he should early make up his mind to one thing. He can never hope to know it all, no matter how narrow the field. He must choose between two courses. The first is aiming to know more than any other man in some very narrow field which he loves and for love of which he is more or less willing to suffer the penalties of the limited scope of his beloved specialty. Thus he may be happy and eminent—although perhaps hungry at times. The second choice requires that he must be willing to drive himself away from what he likes most, into the collateral fields which surround his favorite. Their name is legion. Take industrial chemistry as an example. Consulting demands contact with all sorts of people, and influencing and convincing them, by means of, or in spite of, their prejudices. The candidate for that job needs to know more than a smattering of practical psychology, both normal and abnormal. Also he should be prepared to command the respect and confidence of others. To do this, he should know not only a good bit of practical law to protect himself, but also a lot of high-class ethics, in order to maintain his own conduct and the advice he gives on a plane that is above reproach. Somewhere down the list comes no little knowledge of language so he can clearly understand what is said and say what he means, and later some knowledge of science. He can never hope to learn in advance a substantial proportion of the facts he will need to use. Therefore he must fortify his own factual ignorance with a widest knowledge of principles and their interplay, in order to test the consistency and probable correctness of what others tell him. He should sedulously cultivate an almost child-like apparent candor and simplicity that leads others candidly to admit when and what they do or do not know. And he must seem to believe in their utter sincerity and candor, while checking and cross-checking one bit of information against others, checking alleged facts against theories and theory against proven facts. All the way through life he should pray to be sweetly and kindly, but utterly skeptical; to be gently dominating by his sincere personality, his record and his effectiveness; but deeply humble regarding his own limitations. And he should cultivate an almost wild imagination suggesting to him alone, all kinds of possible causes and consequences. These he must critical-

ly check against tested theory and if they then look logically probable he should check them against fact by ingeniously devised tests. He should always be confident of ultimate success, but never cocksure that he is right this time, until the perfect and lasting success of the commercial operation has proven it beyond any question of the fact.

Mr. Kerr of the famous engineering firm of Westinghouse, Church, Kerr & Co., once advised a graduating class of engineers at Stevens Institute:

> "Success in the profession of engineering—and for that matter in almost any other walk of life—depends largely on a man's ability to select the essentials, discard the non-essentials, go ahead as far as he can see, and then see how much further he can go."

This applies equally to consultants—in any line.

As a matter of fact, if the British journals correctly reflect the situation as it exists there, our industrialists are either wiser or perhaps merely slower than their cousins across the pond. Here consulting chemists are by no means discarded by even the largest corporations. However, it is not uncommon for companies here to use a consultant for a time, then absorb nearly all his time and finally employ him on salary.

Unfortunately, this change of relation progressively destroys most of the peculiar value of the consultant. When he gave only ten per cent or even twenty per cent of his time to one client, he was an independent outsider, whose general income was little affected by keeping or losing the particular client in question. Also, he had varying outside contacts, different outside experiences, and fresh points of view. New clients came in to replace (at least partially) the absence of any one lost, and he did not fear to take the initiative and to accept the responsibility of advising the trial of something that might fail. He told the client the chances—both ways—and his opinion as to the wisest choice. His work did not tend to routinize and become a little more and more perfunctory. He did not slack up on his drive as almost inevitably occurs with a regular, all-time and apparently assured salary. The special deference and subservience to a superior officer of the company were no part of his picture—he was paid to be and stay independent. As an outsider, he did not instinctively oppose outside ideas and methods as things he ought not to have missed, or in deference to the interests of his employed associates. He did not

have to play safe, politic, neutral, and ultra-conservative for fear of opposing internal ambitions and arousing jealousies and enmities. Once he becomes an all-time employee, all of these things come up at least for consideration. Men in close contact with "committee" and "board" deliberations of one or another large corporation have again and again admitted that approvals of any project are almost always unanimous, or quickly become nearly unanimous condemnations. This tells a profound story of human nature. Perhaps human limitations will turn out to be the swan-song of the very large corporation, perhaps cause great expansion in the general consulting field.

One thing is becoming increasingly apparent. Manufacturers and consumers are both discovering disadvantages in the manufacturer's servicing his product with all kinds of consulting advice. True, it helps the manufacturer to hold his customers and get many more—for a while—squeezing out a lot of small competitors. But how it does cost! First to pay for the education of one salesman after another to the specific problems of one user after another, and then to get and teach answers to the new problems created by all the infinite varieties of carelessness and ignorance that are developed by teaching the user to rely for his brains and experience on some sales engineer. We have had a case where a first class dye manufacturer advised, as his best color for a particular fibre, a material which under the conditions prescribed left the fibre quite colorless. On the other hand the consumer, Mr. A., discovers to his surprise that, in spite of having less worry on his own account, he is making less and less profit as the years go by, that his son or successor knows less and less about how to get himself out of trouble, that much of the valuable (and other) advice which he was getting, originated in the plant of his competitor, Mr. B., across town, and then learns that the competitor is now using one of the procedures that Mr. A., himself, developed not so long ago. And it is all perfectly honest and fair because no man can remember where he learned all his tricks, nor can he quite honestly withhold anything he does know, when his best service is promised and paid for with the purchase of the goods.

The value of a good consultant often lies not nearly so much in what he knows, as it does in his ability to bring out and collect what his employer and the latter's employees know, and make them realize what really is often the obvious (sometimes too obvious) conclusion from already known data, and then make them pursue the logical course through decision into proper action.

In one patent case, a lot of work had been done preparatory to filling the bill of complaint, and an exhaustive report had been rendered indicating what the apparent proofs of infringement were, and how they had been developed by the work. A final conference was called to decide about filing the bill of complaint. An outside consultant was asked to sit in, merely for his fresh point of view, as a confirmation or modification. He had done none of the work, was not nearly so good a chemist as the author of the report. He read the report slowly, and apparently somewhat stupidly, but he asked questions and got himself straightened out. Then he held up two of the prepared exhibits, pointed out one or two facts, and asked one simple question. Glances were exchanged around the table, but only one man (the general manager) was needed to express the instantaneous conclusion of all. "Well, I guess we forgot it", was all he said. That hour or two of the consultant's time may have cost the company fifty or a hundred dollars, but it almost certainly saved it between ten and twenty thousand.

This observation checks with my own early education, the personal knowledge of a much older day—the day of my own first job. My immediate male ancestor then remarked, "So, you're going to work, eh? Well, I hope for the next ten years, you'll do about twice as much work as you can possibly be paid for. If you do, for the next ten years, you'll probably get paid just about what you earn. After that, for the rest of your life, you may be reasonably certain of being paid twice what you can possibly earn, for knowing what *not* to do."

One consulting chemical engineer, who probably could not have even understood some of the examination questions and certainly could not have passed a British chemical engineer's examination, was asked to overhaul the largest United States plant in its particular industry and suggest changes of any kind whatever. On each section of the problem, from laboratories and records, through raw materials and manufacture and packaging, costing and statistics, he collected all the available data, insisted apologetically on being made to understand and correlate them thoroughly, and then applied simple remorseless common sense to getting the answer or to planning just how to get it, asking at every step to be corrected if mistaken. His collection of data took about a week, and his report came in about two weeks later. The report was only about eighty typed pages. I learned later that it cost the company several thousand dollars. Carrying out his suggestions took between one and two years and cost nearly a million dollars. However, every year,

for years thereafter the results saved that company much more than the suggestions and carrying them out had cost.

No, I cannot see that the field of the real consultant has been all plowed up, graded and covered with laid-out industrial highways and the massive research laboratories and "service" departments of large corporations. Like every other branch of chemical work and almost any other line of real work, more is demanded of a man in some ways than was demanded a decade or a generation ago, but this is no more true in consulting work than in patent litigation or in corporation employment.

In consulting work, however, *different* things are required, served up in a different way. The need really is for simplicity, hard work, receptivity, coöperativeness, imagination, skepticism, and ingenuity, rather than the traditional (largely imaginary) dignity, superiority, big words, and magical mystery. Consulting may perhaps be a little bit more debunked—that is all, but twenty four years ago an article in the *Journal of Industrial & Engineering Chemistry*, Vol. 5, No. 9, gave a baker's dozen of illustrations of actual consultants' work that did not indicate, even then, the prevalence of bunk and certainly did not require passing any advanced examinations. The need is (and was) for ability to learn from your employer and teach him to think, rather than the ability to lecture to him and his employees, as some imagine might once have been tolerated practice. The need is for horse-sense, rather than any variety of conventionalized performance, and the need is very great.

In closing permit me to offer a word of explanation—and if need be, of real apology to my good friends and remote cousins "across the pond". God knows in these days it were well for us not to misunderstand one another. They have very strongly emphasized one side of the "consultant" picture as they see it and have done so very seriously, as is their wont in scientific discussion. This AMERICAN INSTITUTE OF CHEMISTS is not primarily a scientific society, except as the true humanities have a partial basis in each of many sciences, as well as many arts. So in discussing the very human problem of the "consulting chemist" in this INSTITUTE it has seemed wise for us younger cousins to emphasize the humor and pathos of the fact that industrial problems generally involve as much of human nature as of any other kind of raw material—sometimes more.

I recently learned of a very expensive piece of skilled chemical research finally solved by an outside engineer with the discovery that a

tobacco-chewing workman had been spitting his tobacco juice into the vat when the product "happened" to come out just right. Also of a large candy factory and its force of skilled chemists who had intermittent trouble for some years with marked "bitter taste" in their chocolate and had to be told by a man who knew nothing about chocolate that their roaster gas was being occasionally sucked into their pneumatic elevator to the sugar mills on the top floor. So I sincerely trust that my cousins on the other side will understand, and if need be, pardon, my seeming levity regarding higher education (which, frankly, I deeply envy) and will extend their kindly tolerance and understanding to my plea for the consultant with plain common horse-sense. They may be right ultimately that no man will be a fit adviser without all there is of education. However, I do sincerely doubt if all the learning in all the books regarding all the sciences and all the arts will ever take the place of humble, sincere, skeptical enquiry plus common sense.

Defining a Chemist

by **Raymond E. Kirk, F.A.I.C.**

Head, Department of Chemistry, Brooklyn Polytechnic Institute

THE *Encyclopedia Britannica* says: "Chemist, one who, for pleasure or profit, concerns himself with the acquisition of information relating to the composition of bodies and with the changes of composition which they undergo."

My own more cynical definition of a chemist has long been: "Chemist, one who says that he is a chemist, and persuades enough people to agree with him so that he is able to make a living."

Each definition has its merits. That of the *Britannica* recognizes the dependence of the chemist upon a mastery of his science. The second definition has at least the merit of testing alleged mastery in the rough competition of the market place.

I need not plead in this company for recognition for the science of chemistry. Its beauties and its possibilities have been extolled before you by tongues far more able than mine. There are before me many masters of its practical application in the far flung chemical industries

of the United States. Beside them I see many of the leaders of the academic world in the science. It seems more fitting that we all acknowledge completely our allegiance to what has been called "the noblest of the sciences". Consultant or professor, fellow or junior, each of us is sworn to life-long study of chemistry. Each of us is fully aware of the need for continued attempts to obtain, for man, some mastery over the forces of nature.

One finds little help from college degrees, when he attempts to define a chemist. The lay world may, perhaps, be impressed by the suggestions of "the learned Masters and Doctors" inherent in University practice. The profession (and ours is a profession as well as a science) knows that these are only predictions of potential ability based upon promise during the years of post-graduate training. One recommends post-graduate training to the ambitious young chemist as the most usual route to scientific and professional eminence. It is by no means the only route. It is never a sure path to the goal.

Neither can one place too much emphasis upon college courses. One of the foremost chemists of America was trained as a mechanical engineer. Would any one here dispute his right to the title of chemist? I think not! College faculties, in their undoubted wisdom, plan courses and curricula. They cannot, as faculties, instil scientific enthusiasm or awaken professional zeal. Such achievements require the genius of individual human personalities behind the lecture desk and in the laboratories. Great teachers and competent students are far more important than courses or curricula. Ira Remsen is reported to have said, "Never underestimate the man from the cross-roads college." We can add, he may have had a good teacher! He may be a competent student!

What, then, may we call the "hall marks of the chemist"? Perhaps we may get some help in defining the chemist if we set down the qualities that seem to characterize those whose claim to the title is beyond dispute.

First, the chemist is honest. Mental and moral integrity are by no means confined to chemists but the chemist must have these qualities.

Second, the chemist is a seeker after truth. I mean this in the broadest possible sense. The chemist is primarily an investigator, one who seeks exact information. The phenomenal success of chemists in executive positions is, in my opinion, due to this dominant trait of chemists. Again, this trait is by no means confined to chemists: It would seem desirable, however, for it to be even more usual in executive positions. Chemists as a class seem to be appreciative of "no-men".

In the third place, the chemist has a sense for the practical. He thinks so that he may do, he investigates so that he may bring about some desired result. Knowledge is to lead to accomplishment. I realize that many of our friends do not see the practicality of our immediate tasks. However, the chemist, of all types, is not an idle dreamer. Whether theory or practice be his main concern, he thinks of his work as a small part in the harnessing of nature by man.

The chemist is a man of system. He has mastered a method of investigation. He has learned the necessity of systematic study, of carefully planned investigation, and of disciplined thinking.

The chemist must be intelligent. He must be industrious. He must be accurate and thorough, he must be resourceful and reliable. One might almost make a card catalog of the virtues and prescribe them all. Still we have but little help in defining a chemist. Who is this paragon of all the virtues? Where is he to be trained? Hardest of all, who is to train him?

But, you say, the question is one of knowledge, not of personal qualities; of professional status, not of desirable virtues. I am sure that you will grant the importance of both knowledge and personality. Let us then take up the question of the chemist as a scientist.

The definition of the *Britannica* places the emphasis upon the intent of the chemist to concern himself with the acquisition of knowledge. It does not suggest any measure for the outsider to use in the evaluation of the success, or failure, attending the attempt to acquire knowledge. Here, it seems to me, is the crux of the matter. Here is the question. What criteria, of an objective sort, may one set up in "defining a chemist"?

First, I think one must place the approval of fellow chemists. One is accepted as a chemist if his fellow workmen approve him as a chemist. Here is the great opportunity that was grasped by the courageous founders of THE AMERICAN INSTITUTE OF CHEMISTS. A chemist is not only "interested in the science of chemistry", he is a *chemist*. He is a chemist, because other chemists recognize him as meriting admittance to their fellowship.

Second, the chemist has completed a course of training presumed to give him competence in the science. I would be foolhardy, if I attempted to write a bill of particulars. Each one before me knows the general form that this training should take. We can agree at once upon fundamental training in the several sciences, in mathematics, and in modern foreign languages. History, economics, and philosophy

should be included. Effective training in oral and written English would be prescribed by all. We will be wise, in my opinion, to leave the details to the appropriate educational authorities. A chemist has had, somewhere, appropriate training.

The chemist is a professional man. I have no desire to encroach upon the topic to be discussed by Dr. Grosvenor, but the point must be stressed. A chemist is not a laborer! I hope that each one of you will continue to stress this point. Those of us in educational institutions have a real responsibility in this connection. Those of you in other positions have an equally grave responsibility. The chemist is a professional man. As a professional man, the chemist obtains a salary commensurate with this status. A few weeks ago your speaker received a letter from a New York firm which said that they wished to obtain "the services of a few brilliant students, who are to be graduated in June of this year. — A thorough understanding of the theory of inorganic and colloidal chemistry is essential. We would appreciate the names of any outstanding students you would care to recommend". I recommended an able young man who is expected to receive the Master's degree this June. I also told the firm the average rate of pay that other companies were discussing with our masters men. I received a very remarkable reply indicating that they expected to obtain men as described in their first letter at rates far below "the market" for the year 1937. To this firm chemists are laborers! They are not professional men. Fortunately few firms today have so shortsighted a policy.

The chemist is a creator. He brings to his task a flair for creation which is the more remarkable for being so implicity assumed by his employer. It is not without significance that so many patents are issued to chemists. Years ago, A. D. Little made a "silk purse from a sow's ear". That old master saw the significance of the chemist as a creator. The chemist brings desirable transformations to pass; he retards undesirable transformations. Whether it be bromine from the sea, gasoline from coal, power alcohol from grains and tubers, or silk shirts from cellulose, the chemist is a creator.

A note of restraint must be sounded here lest you think this is a eulogy rather than an attempt at a definition. Chemists are by no means as highly esteemed in all quarters as I may have implied. There are those who look upon the chemist a "technocrat" whose nefarious operations have destroyed the "good old world" in which they used to live. He promotes war and strife, his work contributes to famine, pestilence and disease. He devastates the landscape, he pollutes the streams,

he poisons the wells. The chemist adulterates our food, he debases our textiles, he enslaves our youth by means of habit-forming drugs.

Our answer, of course, is that these ideas are absurd. Yet they are held by many people. So the chemist must today, even more than previously, be prepared to take his place as a citizen, as a responsible member of organized society. He must do his part to restrain abuses in our highly complex industrial system. His training, his abilities and his personality must always be at the disposal of organized society.

We are proud to claim the name "Chemist". We know that our comrades deserve this appellation. We glory in their companionship in the service of humanity.

The real definition of a chemist is what we make the name mean. Each one who knows us defines chemist by us. Indeed, this is as it should be. As individuals and as an organization, we will go forward to redefine the term chemist each year. Each year we hope that it may mean more nearly what we wish it to mean.

The Employment of Chemists

by **W. T. Read, F.A.I.C.**

Dean of the School of Chemistry, Rutgers University

THE average chemist who grew up in the prosperous past in a good university, who found a bevy of scouts from large industries waiting to offer him good jobs, and who for years pursued a peaceful and sheltered existence, thought through these years very little about the problems of employment. When the storm broke at the beginning of this decade, these problems came very sharply to his attention. In some cases it was only matter of reduction in his own pay and of seeing less fortunate neighbors lose positions and go through agonizing weeks and months of unemployment, loss of self-confidence, and actual distress; while in others the average chemist himself lost his job and for the first time in his life realized the vital importance of the whole question of employment in his profession.

I want to discuss this problem from the point of view of THE AMERICAN INSTITUTE OF CHEMISTS. This organization, which is a professional group devoted primarily to the protection and advancement of the chemical profession and to the welfare of the individual and the group, should be the one organization which has the greatest interest in the employment of chemists and the greatest influence in

the future improvement of the status of the employed chemist. The AMERICAN INSTITUTE OF CHEMISTS does not ask that it be allowed to play a lone hand in this game, but that it be free to enlist the coöperation and the support of all other organizations of which chemists are members, to the end that something constructive and permanent may be done.

There are several men much better fitted to discuss this question than I am, and I have not hesitated to call on them for advice and suggestions. In fact this is mostly Mr. M. R. Bhagwat's talk that I am giving. Probably no man in the United States has so broad, thorough, and clear an idea of the whole field of employment as this kindly and efficient secretary of the Committee on Unemployment and Relief of the metropolitan area, 300 Madison Ave., New York, N. Y. Not until the Judgment Day will the full extent of the good he has done in our profession be known. With him is Mr. Lomax, himself a former industrial executive, whose greatest service has been to the older men who needed counsel and advice. Mr. Frank Breyer, who served as Chairman of our committee from its inception, has been a tireless leader in everything for the good of the profession. The splendid and unselfish service of Mr. A. Cressy Morrison made possible the raising of around $50,000 for the work of the committee.

In discussing employment of chemists I want to speak of three classes:

I. From infinity to 100% employable.

II. From 100% to some minimum, that we may place tentatively at 50%, employable.

III. From 50% down to zero employable, which we may lump together as unemployable during a depression.

Class I. Those chemists I have listed as infinitely down to 100% employable may not seem to present any sort of problem to us, but in reality it is much more important that men of superlative ability be employed where they can render the greatest service to their profession, to science, and to humanity, than that a number of misfits be in some way put to work. Key research men who could change the whole field of a science are drawn into industry to hold highly paid executive positions or into the administration of universities. It is doubtful whether even the presidency of Harvard University, one of the most influential positions that a man can hold in these United States, is great

enough to justify the diverting of that infinitely employable and brilliant chemical philosopher, James Bryant Conant. That these men can render such superb service in any field they enter makes them peculiarly desirable to boards of trustees and university corporations as well as to great business enterprises. We all remember when Gilbert N. Lewis was sent to France and some of our wise friends on the side lines remarked on the foolishness of the War Department in sending a college professor, presumably an impractical theorist, into a position that should have been occupied by a trained army officer. Yet on the basis of his shrewd observation of a gas attack, Colonel Lewis was able to develop a most remarkable system of training gas officers.

As he entered the magnificent Mellon Institute the other day, a distinguished chemist remarked that this might help to remove the chemist's inferiority complex and give him the impression that chemistry and chemists amount to something after all. In spite of the truth of this remark, chemists are reminded that the man who develops a process may be rewarded with a few thousands in the way of a bonus, while the attorney who handles the case when the company is sued or is suing because of alleged infringement is paid ten times as much. The infinitely employable chemist is not paid enough to hold him in the type of research or teaching where he can be of greatest value to the world.

Class II. We have been talking about the exceptionally gifted chemist who can do a number of things equally well. We now come to the average capable chemist who can do the work of a chemist better than he can do anything else by which he can make a living, and give an adequate return for what he is paid. He may be a passable musician, artist, wood carver, grower of tulips, or sailor of a catboat, but chemistry is his real field. Not all such men are 100% employable. They have to be trained, disciplined, and fitted to their jobs. If my memory has not played me false, I believe that I heard Dr. Weidlein say some time ago that of the several hundred former fellows of Mellon Institute of nearly a quarter of a century, not one was unemployed for any length of time even during the worst of the depression. These men were trained not only in their special fields, but they were trained to coöperate with others.

There are men, however, who are not 100% employable for one reason or another, but by the use of tact and common sense may be placed in the right position and given the opportunity to do their best work. The large companies have wise personnel men who are excep-

tionally gifted in discovering the capabilities of men and adjusting their work to their capabilities. Dean Webster N. Jones of Carnegie Tech was such a man, and although a research director, was of special value to the B. F. Goodrich Company because he found where every chemist could be happiest and most useful. There are certain personal handicaps which utterly unfit a man for one job, but do not interfere with his holding another. As such handicaps increase, the man becomes less and less employable until he finally reaches the deadline I have set at 50%. Beyond that he is entirely unemployable in a depression, and only in times of greatest lack of men can he be reasonably sure of employment.

Class III. Those who fall into this class, that is from 50% to 0% employable, are a real problem to the chemical profession. Whatever is done for them must be in the nature of human salvage. A few in this class are unfit for any sort of work of a technical or professional nature. They are as prone to make mistakes as the sparks to fly upward. One chemical engineer was heard to remark that it would be very profitable to many organizations to pay certain individuals not to work for them because of the extremely costly mistakes they continually make. Not even the most ingenious and imaginative superintendent can forsee and prevent all the ridiculous things a born blunderer can do. Then there are those who might make good mechanics, good clerks, good filling station operators, who are not worth their salt as chemists.

Finally there are the older men, and here we have a problem that the chemical profession needs to tackle seriously and vigorously. Regardless of the merits and demerits of our social legislation, the fact remains that a man past forty-five or fifty finds it practically impossible to find a new job if he has become separated from his former job.

With these classes in view, it is the task of THE AMERICAN INSTITUTE OF CHEMISTS to assume intelligent and vigorous leadership in solving the employment problems of our profession.

First may we examine the causes of unemployment. Mr. Bhagwat has summed them up for me as follows:

1. Discontinuance of some part of a company's work.
2. Consolidations of sections within a company or of consolidations of several companies.
3. Transfer to distant location.
4. Technological unemployment due to new discoveries

and inventions.

5. Personal disagreements between employee and employer.
6. Unsuitable employment.
7. Old age, ill health, and physical disability.
8. Other reasons beyond the control of either employee or employer.

The most serious of all causes have obviously been 1 and 2, which in most cases had to do with a business depression.

The blow has fallen most heavily on two groups of individuals, among whom may be found representatives of each of the three classes I have cited. These are the graduates who came out of our schools during the depression, and older men from forty to fifty. There are also the European refugee chemists who are willing to take anything to gain entrance into the American field.

THE AMERICAN INSTITUTE OF CHEMISTS is inheriting the experience as well as the responsibility of the Committee on Unemployment and Relief for Chemists and Chemical Engineers, commonly known as the Breyer Committee. It is our job first to set up an organization satisfactory to this committee. We are then to administer the present funds for relief purposes only. It is next our job to raise other funds, not only to carry on the work of relief when the present funds are exhausted, but also to do a broader and more fundamental type of work for the permanent benefit of the profession.

In an able editorial in the May number of *Industrial and Engineering Chemistry*, Dr. Howe has pointed out the problems of placing well qualified chemists and of finding those who have the qualifications for positions that are now rapidly becoming available. He points out the necessity for going back to the sources of our supply of chemists, the schools, to make sure that instruction is sound, and the equal necessity of the schools knowing more about the reputation of chemical industries into which they are sending their men.

To sum up the experiences of the Unemployment Committee, it may be said that 2,600 individual applications have been received, most of them from those whom Dr. Kirk would classify as chemists. Of these 25% are still in the active file; 28% are permanently placed; 32% have been lost by their failure to respond to inquiries and are presumably placed or permanently out of the profession; and 15% are outside of the 50 mile limit set for the committee. Alumni of 240

schools are represented. Still from 175 to 200 visits are made per month to the committee's offices by employable chemists. Those who fall in Class III are not included.

Mr. Bhagwat tells me that many who have talked to him were sadly uninformed about industry, even their own industry. Many lacked self-confidence and an effective method of approach. Many had lived such self-centered lives that they could not express themselves clearly. However, a large fraction of these men and women showed honesty and intelligence necessary for the pursuit of a profession.

The work in the field of employment which the INSTITUTE is to undertake may be considered under these tentative proposals.

1. Investigation of educational institutions and grading these schools.

2. Recommendations as to improvements in curricula and instruction. This is not because the INSTITUTE is suffering from "an itch to advise" (as I have heard it put by a certain shrewd politician), but because it has a sincere desire to coöperate in improving our profession.

3. Informing students regarding the chemical industry and the work they can do in it.

4. Guidance of students in choosing the field in which they have special aptitudes.

5. Establishment of a central registration bureau, where records of all employable chemists could be kept. Whether this should be a licensed employment bureau that is self-supporting, or a bureau of information supported by gifts making its record public to all qualified and entitled to use them is yet to be determined.

6. Obtaining from employers information regarding all vacancies.

7. Educating industries into greater use of chemists.

8. Educating the general public as to the value of the services of the chemist.

9. Study of methods employed by the chemical profession in other countries in the raising of professional standards.

10. Inducing all chemical organizations to pay more attention to the social and economic problems of the individual chemist.

Whatever the organization THE AMERICAN INSTITUTE OF CHEMISTS may set up, it should certainly have the coöperation of all scientific and technical societies of which chemists are members.

Socially beneficial and equitably remunerative employment is a great problem, but one which vitally concerns THE AMERICAN INSTITUTE OF CHEMISTS, and to the solution of which we should dedicate our best efforts.

Joseph E. Chapin

It is with deep regret that THE AMERICAN INSTITUTE OF CHEMISTS records the death of two of its charter members: Joseph E. Chapin, on April twenty-fifth, and Frederick A. Leslie on February seventeenth.

Joseph E. Chapin was born in Auburn, New York, in 1879. After completing six years of work in chemistry at Cooper Union, New York, he received the Bachelor of Chemistry degree. From 1915 until his death, he was in charge of the chemical laboratory of the Philadelphia Navy Yard. His specialty was analytical work, particularly the analysis of rubber and rubber products, and varnish raw materials.

Frederick A. Leslie

Frederick A. Leslie was born at Kemptville, Ontario, Canada, in 1886. He was educated at Columbia University, obtaining the Ph.C. and Phar. D. degrees, and for eleven years taught in the Columbia University School of Pharmacy. Later he became chief of the drug division of the Department of Health of New York City, and also testified as an expert in the Courts of the City of New York. He was also general chemist for Loft, Inc., for several years. At the time of his death he was chemist for Leslie and Company, New York, N. Y.

William Foster

THE AMERICAN INSTITUTE OF CHEMISTS records with deep regret the death of William Foster, Honorary Member, on May 25, 1937. He became a Fellow in 1929 and was elected to Honorary Membership in 1936.

Dr. Foster was born at Hartford, Kentucky, in 1869. He studied at Hartford and Vanderbilt Universities before going to Princeton, where he received the Ph.D. degree. Since 1900, he has been a member of the faculty of Princeton University. He was the author of several text-books on chemistry for colleges, and also contributed various papers to the chemical periodicals. He specialized in the conductivity of electrolytes, chlorinated ethers, and arsenic compounds, and was also interested in the application of chemistry to archaeology and did much work on antiquities from Corinth and Athens.

BOOKS

REAGENT CHEMICALS AND STANDARDS. By Joseph Rosin, F.A.I.C. *D. Van Nostrand Company.* Price, $6.00.

The increasing need for and wide diversification of precise control work have for some years necessitated a more up-to-date volume on this topic than Murray.

Dr. Rosin's book is well designed to satisfy this need. It contains almost five hundred pages of monographs on reagent chemicals, including a specification and methods of test for each of the impurities listed in the specification. Where an assay is required, this also has been included. To some extent, the specifiations and methods of test of the Committee on Analytical Reagents of the American Chemical Society have been employed, although in many cases, the author has made use of newer and more precise methods largely developed in his own experience of over a quarter of a century.

There are also provided a list of directions for making up reagent solutions to be used in the tests, tables of the equivalents of normal and tenth-normal solutions, directions for making these, and a short discussion on pH, including a table of suitable indicators with directions for preparing their solutions.

The reviewer has not been able to discover any startling errors in the book in the course of a fairly careful reading. It is possible that there may be some which would appear from the application from one or another of the monographs in the book.

However, as a reference work on its subject, the reviewer feels that the volume at hand is by far the most complete and up-to-date available, and that it belongs in the library of every laboratory which does accurate analytical work in any quantity.

—K. M. H.

ELECTRON DEFRACTION. By R. Beeching.
THERMIONIC EMISSION. By T. J. Jones.
INFRA-RED AND RAMAN SPECTRA. By G. B. B. M. Sutherland.
FLAME. By O. C. de C. Ellis and W. A. Kirkby.
THE CHEMISTRY OF RUBBER. By H. Freundlich.
The Chemical Publishing Company of New York. $1.25 each.

These little volumes, all published in England, but available in this country, are designed as monographs each on their special subject. They are neatly made and contain in the neighborhood of one hundred

pages each of well documented and indexed discussion.

As a means of acquainting oneself with the study of a particular small branch of science, they are well adapted. With the exception of the volume on Rubber, they demand of the reader a firm background immediately surrounding the field covered, and of course, sufficient mathematical training to follow theoretical developments.

The reviewer feels very strongly that for working knowledge of a subject, it is more important to express it in precise language than to follow it through its mathematical development. In this respect, these volumes are weak. However, they share the weakness with an overwhelming majority of other books in the same field, so that it is probably unfair to criticize them on this score.

With these limitations, they are handy and useful, although naturally directed more to special interests than to general.

—K. M. H.

PHOTOGRAPHY. By C. E. K. Mees. *The MacMillan Company.* $3.00.

The director of research and development of the Eastman Kodak Company has written a comprehensive account of the photographic art and industry in non-technical language, although chemical processes are discussed in some detail. He begins with the earliest photographic discoveries and covers the field up to the elaborate technic of the sound film, including photographic materials, color photography, moving pictures, sound recording and synchronization, and animated cartoons. Modern motion picture technique is particularly well treated, as is the new color process.

The book is illustrated with sixty-three plates, several in the three-color process, and with many illustrations. It is typographically excellent. The book is, of course, based almost entirely on the work of the Eastman Kodak Company, but as such is an excellent presentation of the development of photography in America.

—V. F. K.

A CATALOGUE OF THE EPSTEAN COLLECTION. (On the History of Photography and Its Applications especially to the Graphic Arts). *Columbia University Press.* $1.50.

This catalogue was prepared by the Columbia University Library to make the contents of the Epstean Collection known to students of

photography and the graphic arts, and to libraries. The Epstean collection of books, pamphlets, and periodicals on photography is one of the most comprehensive libraries of that subject in existence. When the collection was presented to Columbia, that library added its own books on the subject. In cataloguing this collection, it was thought that this publication might serve as a key to the accumulated wealth of photographic literature, as there is at present no comprehensive bibliography of the subject available in print. —V. F. K.

INTRODUCTION TO THEORETICAL CHEMISTRY. By Meldrum and Gucker. *American Book Company.* $3.50.

This textbook is intended to be used in connection with qualitative or quantitative analysis in second year college chemistry. The authors have recognized the great expansion in the number of chemistry topics to be studied and the inevitable superficiality and lack of true perspective acquired by the student. This text is an attempt to bring the basic principles of chemistry and their interrelationships into a unified whole. It treats of the discovery and classification of the elements; the laws of chemical combination and their explanation on the basis of Dalton's atomic theory; the laws of gaseous behavior and their explanation by the kinetic theory; solutions and osmotic pressure; fundamental chemical theory; velocity of reactions, equilibrium; the ionization theory; radiations and radiolytic phenomena; the theory of atomic structure and its application, etc. It is excellent as a link to the later physical chemistry and a stimulant to interest in that direction. In addition, the reference bibliographies at the end of each chapter should recommend it to both student and faculty. —M. R. E.

CONDENSED REVIEW OF PHARMACY. Fourth Edition—1937. By George W. Fiero, F.A.I.C. *John Wiley and Sons.* Price $2.00.

Dr. Fiero, assistant professor of materia medica at the University of Buffalo, has prepared a ready-reference guide for pharmacists, physicians, and nurses, which contains a résumé of all the drugs, chemicals, and preparations of the U. S. Pharmacopœia and the National Formulary. In its condensed, brief form, it is also of particular value to pharmacy students who wish to review their work before taking examinations. It contains in Part One, Practical Pharmacy; Part Two, Galenical Pharmacy; Part Three, Materia Medica; Part Four, Toxicology and Part Five, Elementary Chemistry, including the structural formulas of U. S. P. chemicals. —B. M.

MAN IN A CHEMICAL WORLD. By A. Cressy Morrison. *Charles Scribner's Sons.* $3.00.

Chemists who explored the world of science followed many paths which led them to rich lands. They sent back this abundance to mankind through the establishment of chemical industries. Man, however, lost sight of the explorers and neither understands nor remembers the source of his material advantages. To enlighten him, this book, delightful and illuminating, is "designed to place before the public, in simple language, the unsurpassed contribution of the chemical industry . . . to the well-being of the individual . . . and as a contributor to human comfort, protection, and the advancement of civilization."

Our present material culture is built upon chemical industry, as this book vividly portrays by taking up in survey the subjects of health, food, transportation, communication, luxuries, industrial operations, shelter, and clothing. The transition from the self-sufficient landowner, who supplied all his needs by growing and fabricating bare necessities, to his grandson, who purchases the materials manufactured by many industries, is testimony to the rapid growth of chemical industry in this country. The remarkable freedom today from the diseases and hardships of earlier times is tribute to the regeneration which chemistry is bringing to humanity. To read this book is to realize that Prometheus, typifying mankind, has used knowledge as a weapon to defeat evil, and is unbound at last from the shackles of ignorance to triumph through wisdom.

"The Crystal Reveals" is the title of the last chapter of *Man in a Chemical World*. Chemists are on the threshold of practical applications of additional knowledge in the fields of medicine, nutrition, agriculture based on a synthetic environment, abundant food supply for all peoples, synthetic production of raw materials, not to mention a hundred thousand new products of possible commercial value. The conquest of the material world emphasizes the necessity of new economic and sociological designs to guide civilization in a new environment. Intelligence, leadership, and vision are needed to overcome the inertia of patterns of thought inherited from an older world.

The American Chemical Society's Tercentenary Celebration of the founding of American chemical industries inspired this volume. Typographically excellent, illustrated by Leon Soderston, clearly written, it is a fascinating account of the contributions of chemists to the world. It will give not only information but also much pleasure to all who read it.

—V. F. K.

ANNUAL MEETING—1937

The fifteenth Annual meeting of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on May 15, 1937.

Talks of exceptional interest to chemists were given by Dr. William M. Grosvenor, Dr. Raymond R. Kirk, and Dr. William T. Read. These addresses appear in full in this issue of THE CHEMIST.

The following councilors were elected to serve for the term 1937-1940:

Dr. Ross A. Baker
Dr. Lloyd Van Doren
Dr. Gerald Wendt

After discussion, it was voted that the name of THE AMERICAN INSTITUTE OF CHEMISTS should not be changed.

The Secretary reported the following members as deceased during the year:

Honorary Members

Otto P. Amend
Edward C. Franklin

Fellows

Joseph E. Chapin
John Edwin Dowd
Kurt Walter Franke
Frederick A. Leslie
Ernest J. Manfredo
Julius Arthur Nieuwland
Allan F. Odell

The matter of the amount of dues was referred to the National Council for its consideration.

The committees appointed during the season reported their activities, according to the following reports.

Report of the Secretary

I am pleased to submit this report upon the most successful and promising year of THE AMERICAN INSTITUTE OF CHEMISTS.

The following activities upon membership were taken by the National Council during the year:

Elections

Honorary Member	1
Fellows	257
Associates	11
Juniors	40
Students	2
Total	311

Loss of Membership

Resignations

Fellows	5
Associate	1
Juniors	2
	8

Dropped

Fellows	8
Associate	1
Junior	1
	10

Deceased

Fellows	7
Honorary Members	2
	9

Reinstated

Fellow	1
Junior	1
	2
Net Loss for year	25

Total, 286 Net Increase in Membership.

Actions

Fellows raised to Honorary Members	1
Associates raised to Fellows	4
Juniors raised to Associates	2
Students raised to Juniors	3

Membership	1935-36	1936-37
Honorary Members	7	6
Life Members	2	2
Fellows	645	894
Associates	103	113
Juniors	71	101
Students	9	8
Total	837	1124

The National Council held eleven meetings during the year with an average attendance of ten councilors.

We have today the largest membership in the history of the INSTITUTE; we elected more members last year than in any previous year, and the high scholarship and scientific standing of the newly elected members is a notable feature of the advance of the INSTITUTE.

The credit for this increase in membership belongs almost entirely to the activities of the Membership Committee, under the leadership of its chairman, Dr. W. T. Read, who was the energetic and untiring leader of the Nominating Committee of the previous year which increased the membership by 178, thus making a total of 439 new members during two years.

The possibilities of increasing the membership by individual efforts is evidenced by the fact that one member, Robert J. Moore, proposed 111 members during the past year, a record that every member should endeavor to equal or exceed.

The Jury on Medal Award has awarded the INSTITUTE medal to James F. Norris, professor of organic chemistry at Massachusetts Institute of Technology, for noteworthy and outstanding service to the science of chemistry and the profession of chemist in America.

The reports of the President, Treasurer, the Chapters and the various committees indicate the activities of the INSTITUTE and need not be repeated by me.

I wish again to express my appreciation of the faithful and loyal service of my assistant, Miss V. F. Kimball, in furthering the interests of the INSTITUTE in both her assistance to me as Secretary and in her capability as Editor of THE CHEMIST.

HOWARD S. NEIMAN,
Secretary.

Report of the Committee on Unemployment

The Committee on Unemployment of THE AMERICAN INSTITUTE OF CHEMISTS has been in close contact with the unemployment and relief situation for chemists through the New York Committee on Unemployment and Relief for Chemists and Chemical Engineers, which is an activity sponsored jointly by numerous technical societies.

Your chairman, who happens to be chairman of the New York Committee on Unemployment, has felt for some time that the latter committee's work could best be turned over in a permanent form to THE AMERICAN INSTITUTE OF CHEMISTS and has finally obtained a vote from the New York group, authorizing the transfer to THE AMERICAN INSTITUTE OF CHEMISTS, as of December 31, 1937, under the following conditions:

"That the Committee on Unemployment and Relief for Chemists and Chemical Engineers, through its sponsors and advisors, turn over on December 31, 1937, to THE AMERICAN INSTITUTE OF CHEMISTS, its remaining funds, its records, and if desired, its personnel, subject to the following conditions: (a) THE AMERICAN INSTITUTE OF CHEMISTS set up an organization satisfactory to the Com-

mittee on Unemployment and Relief for Chemists and Chemical Engineers, prior to November 1, 1937. (b) Funds for this permanent organization to be raised by THE AMERICAN INSTITUTE OF CHEMISTS. (c) The funds of the Committee on Unemployment and Relief for Chemists and Chemical Engineers having been given for relief, be used only for relief, relief for this purpose being defined by past practice of the Committee on Unemployment and Relief for Chemists and Chemical Engineers."

Complete plans have not as yet been developed by the INSTITUTE'S committee for handling this activity, so that we may go before the annual meeting and ask for entire approval. The matter is in such shape, however, that your chairman will be glad to state the plans broadly at the annual meeting and to ask for a vote of confidence from the membership as to proceeding further with their crystallization in more definite shape than they now are.

No action on the part of the INSTITUTE is required before October, so that there is no need of pushing your committee members for final plans when they have been busy preparing for the annual meeting and easing down generally on technical society activities for the summer.

It is not too early, however, for work in one direction, that is, an effort to get the Department of Labor to make a census of chemists similar to the census of engineers that was recently completed. It is hoped that this may be gotten under way within a reasonable time and that the Department of Labor will utilize the services of the employees of the New York Committee on Unemployment and Relief for Chemists and Chemical Engineers, thereby conserving some of the funds still available.

FRANK G. BREYER,
Chairman.

Treasurer's Report

Schedule of Operating Income and Expenses

for the year ended April 30, 1937

Income		
Members Dues	$4,002.65	
Less Reserve for Chapter Refunds	289.72	
Net Income from Dues		$3,712.93
Expenses		
THE CHEMIST, Publication	$2,828.58	
Less Income-Advertising	$876.41	
Subscription	100.35	976.76
Net Cost of THE CHEMIST	1,851.82	
Medals	94.29	
Council Meetings	70.45	
Membership Expenses.	348.86	
Office Rent	600.00	
Office Light	27.84	
Telephone & Telegraph	141.74	
Postage	254.00	
Stationery and Printing	385.56	
Office Salaries	1,820.00	
Towels	16.80	
Auditing	91.66	
Interest on Notes Payable	52.16	
General Expenses	13.66	
Total Expenses		5,768.84
Excess of Expenses over Income for year ended April 30, 1937		$2,055.91

The deficit amounting to $2,055.91, as shown in the above operating statement of income and expenses, was covered by special contributions amounting to $2,365.00.

Report of the Committee on Membership

Your Committee on Membership has not been extremely active during the past year for the main reason that the funds of the INSTITUTE were not sufficient to carry on the program begun last year. A large number of letters were sent out under the President's signature about this same time last year inviting fully qualified chemists with established reputations to become Fellows of the INSTITUTE. A gratifying number accepted our invitation. A follow-up letter was prepared but was delayed both on account of funds and on account of the feeling that it would be well to have the proposal of the INSTITUTE to undertake the work of the New York Unemployment and Relief Committee finally passed on.

In the meantime several active members of the INSTITUTE, notably Dr. R. J. Moore, our vice president, through their personal efforts have brought into our organization a considerable number of able chemists as Fellows. The Council instructed President Toch to appoint several men as representatives of industries to secure members from their groups.

With the expansion of the INSTITUTE's activities, a particular appeal can be made to all chemists interested in welfare of their fellow chemists as individuals and in the welfare of the profession to join us and lend their active aid.

Gifts for the specific purpose of presenting the work of the INSTITUTE to the chemical profession and inviting those interested in this work to apply for admission as Fellows of the INSTITUTE should be solicited.

Copies of THE CHEMIST containing the roster and special articles should be distributed to a number of members, who will use them in interesting other chemists in the INSTITUTE.

Every effort should be made during the coming year to build up the membership so that the weight of influence of a larger number of active and working chemists may enable the INSTITUTE to carry out the enlarged program which is being undertaken.

W. T. Read, Chairman.

Report of Committee on Economic Status of Chemists

The following suggestions are presented for consideration by the INSTITUTE:

That a survey of the economic and professional status of the chemist be made by sending out questionnaires prepared through the joint coöperation and expert advice of the U. S. Department of Labor and THE AMERICAN INSTITUTE OF CHEMISTS. This survey should include from 20,000 to 25,000 chemists in all divisions of the profession, in order to provide an ample and sufficient basis for determination. Dr. Lubin of the Department of Labor has indicated a willingness to make such a survey in the event that he is officially requested to do so, and is furnished with the addresses of chemists to whom the questionnaire should go. Your committee feels that such a survey should be made at the earliest possible date, and proper action taken to collect the names and addresses required for this survey.

The matter of licensing chemists, through the enactment of legislation in various states, should be investigated and steps taken to bring about such result. If found advisable, the membership of THE AMERICAN INSTITUTE OF CHEMISTS should form one of the pre-requisites to secure such a license.

A national appeal board, consisting of five members approved by the national council of the INSTITUTE, should be appointed. This board, in turn, should select regional appeal boards to serve in congested industrial areas, such as New York, Chicago, Pittsburgh, etc. They should be empowered to consider instances of conduct on the part of individuals and concerns whose practices were deemed to be prejudicial to the industry and to the chemist. This might include also the cataloging of information regarding unethical and prejudicial practices.

A standard form of contract for the chemist should be formulated, and placed at the disposal of every chemist, whether a member of the INSTITUTE or not. When such a form of contract has been decided upon, its availability should be made known to all chemists.

Greater publicity should be given to the work of the chemist so that the public may realize more fully the important role of such work. This might be accomplished through greater publicity in the daily press, addresses before various societies and clubs, and perhaps a magazine devoted entirely to the rôle that the chemist plays in connection with materials utilized in daily life.

LLOYD VAN DOREN,
Chairman.

Report of the Committee on Professional Education

The Committee on Professional Education has had very little activity this year. The work of the Committee has already been very well covered with the exception of a further survey, and surveys have not been possible during the past year. We should like to make the following suggestions with respect to the future work of the Committee:

First, that during the next year, some effort be made to study the situation with respect to the training and possible opportunities for women chemists. Many questions arise here. We recognize no limitation so far as they are trained and so far as the nature of the work permits. Under these conditions they are on the same basis as men. However, the Committee might formulate the limitations imposed by the nature of the work so that educators would know what they are and make recommendations of types of chemical service which women chemists could perform with distinction.

Next is the problem of the young people trained in science in the high schools and junior colleges. Though they are not adequately trained, still there is no greater activity in the whole field of education today than the so-called "Junior Science" activity. Many of these youngsters cannot go to college. Just what opportunities are going to be available for them? The committee for the coming year could certainly give attention to these problems.

It is gratifying to report that even now we are still getting letters from educational institutions asking us about the course of training that the INSTITUTE recommends through the previous report of the Committee, or telling us that they are following such a course. I have an interesting letter from a large university in the Middle West asking our opinion concerning changes which they were expecting to make, not in chemistry, but in English, German, and economics requirements. Should increased requirements in economics be made of chemists? Should requirements in German be reduced? In other words, the Committee's report has had some influence on the development of curricula for the training of

chemists, and will continue its influence, if we can find a means of supporting it. The first two years of expense was not borne by the INSTITUTE but by private subscription.

It would be wiser to delay an additional survey until times are better. I hope that next year a new committee will find the time appropriate to make a new survey based on the knowledge which we have already obtained.

M. L. CROSSLEY, *Chairman.*

Report on THE CHEMIST

THE CHEMIST has maintained its policy of reporting fully the activities of the Council and Chapters in order to keep the membership informed of the INSTITUTE'S progress.

Articles of exceptional merit were received from members or others during the year and several of them were reprinted in such publications as *Reader's Digest, Science Digest, Canadian Chemistry and Metallurgy, Opportunity,* and other journals.

THE CHEMIST is an open forum for the expression of opinions regarding the professional side of chemistry. Authentic articles are always welcome. There is no standardization of subject matter. Whatever interests chemists as professional men is acceptable.

Members are invited to send in news items about themselves, articles of professional interest, or information about the profession of chemistry which will be of interest to chemists generally. It is hoped that even greater coöperation will be given THE CHEMIST next season and that it will receive generous support.

A circulation increase of more than twenty-five per cent this year is encouraging. Publicity released by THE CHEMIST has been copied widely by the press.

We are indeed grateful to all who contributed in any way to THE CHEMIST; to Mr. Howard S. Neiman for his generous coöperation and counsel; to the National Council, and to the president, Dr. Maximilian Toch.

—V. F. Kimball, *Editor.*

Report of the Niagara Chapter

The Niagara Chapter has held four regular meetings during the year, details of which have been published in THE CHEMIST. Throughout the existence of the Chapter, the program meetings have been characterized by animated and informal round-table discussion. This has no doubt been due to the fact that the speakers and discussion leaders have been drawn almost entirely from the membership of the Chapter. The membership regards the stated meetings as one of the most interesting phases of the Chapter's life.

The Welfare Committee has had little work this season, since the number of unemployed chemists in the area has become almost negligible. A valuable service to the local area has been completed during the year, for the initiation of which the Chapter is in considerable measure responsible. This consists in the compilation by the Grosvenor Library of a collective list of the chemical periodicals and major reference books available in the various libraries in the Niagara Frontier. This list has been issued in mimeographed form.

The Membership Committee has extended invitations to about sixty local chemists to attend meetings during the year. No attempt has been made to urge membership upon any of these, though several have subsequently applied for membership in the INSTITUTE. A list of over thirty of these prospective members was sent to Miss Kimball with the suggestion that sample copies

of THE CHEMIST be sent them. The roll of the Chapter now shows forty-two members. Student members have been elected from Niagara University, the University of Buffalo, and Canisius College.

At its recent meeting the Chapter elected Dr. Howard W. Post, of the University of Buffalo, as chairman for the succeeding year. Dr. Post has been one of the moving spirits in the Chapter since its organization and may be counted on to advance the interests of the INSTITUTE in all possible ways.

G. H. CARTLEDGE,
Chairman, Niagara Chapter, A.I.C.

Report of the Washington Chapter

The officers during this term consisted of Dr. C. E. Munroe, honorary president; L. N. Markwood, president; N. W. Matthews, vice-president; R. B. Deemer, Secretary; and J. B. Martin, treasurer.

Emphasis this year was placed upon bringing the members together more often, in order to sustain interest in the organization; to create a spirit of professional dignity; and to invite the attention of prospective new members. To this end, in addition to the regular evening meetings, a series of luncheons was inaugurated. This innovation met with favorable response from both members and guests, and should ultimately prove fruitful to the INSTITUTE.

Four regular meetings were held, of which two were business sessions. One was a joint meeting with the local section of the American Chemical Society, at which we had the pleasure of an address by our national president, Dr. Maximilian Toch, on "The Scientific Authentication of Works of Art". At another meeting the speaker of the evening was Mr. P. J. Federico, assistant examiner of the U.S. Patent Office, who discussed, "The Evolution of the Patent Laws."

At each of the luncheons an invited guest of honor brought a message appropriate to the occasion. At the first such affair, the guest was Dr. W. W. Stockberger, director of personnel of the United States Department of Agriculture. He pointed out that the way lay open whereby the group might suggest ways of improvement for chemical employees in the Federal service; and that such suggestions would stand in a favorable light, if it could be shown that they were mutually advantageous.

The next luncheon was addressed by Mr. E. P. Coffey, director of the laboratory of the Federal Bureau of Investigation. He described the inner workings of that unit, whereby the G-man gets his man.

Dr. Edgar B. Brossard, member of the United States Tariff Commission, at the third luncheon, gave an idealistic exposition of the desirability of men learning to work and live together in peace, avoiding strikes, and wars, and all forms of disharmony.

The final luncheon was the climax of the series. We were honored by having the Honorable Henry A. Wallace, secretary of the United States Department of Agriculture, as our guest. His thought was that scientific progress in the future was to be achieved by "building bridges between different methods of approach".

These affairs were attended by the full capacity of the private dining room in which they were held, that is, roundly thirty persons. The presence of an appreciable number of non-member prospects was always sought.

Two trips were indulged in during the season. One, as a result of Mr. Coffey's talk, was to the laboratory of the Federal Bureau of Investigation. About sixty members and guests were conducted on a special tour of this interesting place, being shown the diverse tools of science versus crime, from finger-printing to pistol shooting.

The annual trip of the chapter to Baltimore took the form of an inspection of the plant of the American Sugar Refining Company. This was followed by a dinner and meeting. Our guest on this occasion was Mr. Frank G. Breyer, member of the Council of the INSTITUTE. He spoke to us on "The Means of Achieving Professional Standing for Chemists and Chemical Engineers." His remarks provoked a lively discussion on this, one of the important objectives of the INSTITUTE.

During the year, this chapter has given considerable thought to the actual accomplishment of INSTITUTE aims. At the request of the chapter, our president appointed a committee to develop an active program bearing on those aims. So far no tangible results have emerged, but the chapter can not urge too strongly that the matter be not allowed to die. The growth and hope of the organization, we believe, depend upon a forthright, even militant, program.

In the matter of dues the chapter goes on record as opposed to any blanket increase in the present levels. It believes that the budget should be balanced on the basis of present income. If additional funds must be had from time to time, it believes that the better way of raising them would be by levying special assessments, which is a painless, indirect way, but fully effective. If it develops that increased funds are a constant requirement of the future, then a variable scale of dues, as already proposed to the Council, is further recommended. This scale is to be dependent on the member's income, so that it will always be possible for those in the lower brackets to be Fellows of the INSTITUTE at the present rate of $5.00 per year.

Respectfully submitted,
L. M. Markwood

Report of the New York Chapter

Dr. Raymond E. Kirk reported verbally for the New York Chapter, commenting upon the continued enthusiasm of the members and the successful meetings held during the year which were exceptionally well attended.

Report of the Pennsylvania Chapter

Dr. Joseph W. E. Harrisson reported verbally for the Pennsylvania Chapter. Eight meetings were held during the year of which half were devoted to technical subjects and half to professional subjects. Two plant visitations were held, the last one to the Philadelphia Navy Yard, where Mr. Joseph E. Chapin, F.A.I.C. acted as guide. Mr. Chapin's recent death is reported on page 157 of this issue of THE CHEMIST.

Dr. Gilbert E. Seil, the new chairman of the Pennsylvania Chapter was introduced by the retiring chairman.

COUNCIL

OFFICERS

President, MAXIMILIAN TOCH
Vice-President, ROBERT J. MOORE
Secretary, HOWARD S. NEIMAN
Treasurer, BURKE H. KNIGHT

COUNCILORS

ROSS A. BAKER
FRANK G. BREYER
HANS T. CLARKE
M. L. CROSSLEY
NEIL E. GORDON
HENRY G. KNIGHT
W. T. READ
ALLEN ROGERS
NORMAN A. SHEPARD
LLOYD VAN DOREN
GERALD WENDT

CHAPTER REPRESENTATIVES

New York	*Niagara*	*Philadelphia*	*Washington*
FREDERICK W. ZERBAN	ARTHUR W. BURWELL	C. W. RIVISE	LOUIS N. MARKWOOD

The one-hundred and forty-second meeting of the Council of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on May 15, 1937, at 11:00 o'clock A.M.

President Maximilian Toch presided.

The following officers and councilors were present: Messrs. R. A. Baker, F. G. Breyer, M. L. Crossley, B. H. Knight, L. N. Markwood, R. J. Moore, H. S. Neiman, W. T. Read, C. W. Rivise, N. A. Shepard, M. Toch, L. Van Doren, and F. W. Zons. Dr. J. W. E. Harrisson, Chairman of the Pennsylvania Chapter, was present. Miss V. F. Kimball was also present.

The minutes of the previous meeting were approved.

The Treasurer's report, showing a balance on hand of $1562.48, was read and accepted.

Dr. Toch reported his further activities in connection with the bill presented to the New York State Legislature by the Pharmacists.

The following new members were elected:

FELLOWS

HARRY W. CHARLTON, *Supervising Engineer* in Charge of Chemical Work, Department of Parks, Chemical and Bacteriological Laboratory, Pelham Bay Park, New York, N. Y.

WILMER H. KOCH, *Chief Works Chemist,* Niagara Operations, The Mathieson Alkali Works, Inc., Niagara Falls, N. Y.

WILLIAM M. MALISOFF, *Research Physicist,* Montefiore Hospital, New York, N. Y.

MARION C. PFUND, *Professor of Foods and Nutrition,* Cornell University, Ithaca, N. Y.

FRANK M. SCHAD, *Director of Laboratories,* American Pharmaceutical Company, New York, N. Y.

MAURICE SIEGEL, *Partner,* Strasburger and Siegel, 15 S. Gay Street, Baltimore, Maryland.

ASSOCIATE

EVERETT L. SAUL, *Chief Chemist*, Felton Chemical Company, Inc., Brooklyn, N. Y.

There being no further business, adjournment was taken.

The one-hundred and forty-first meeting of the Council of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on April 22, 1937, at 6 o'clock, P.M.

President Maximilian Toch presided.

The following officers and councilors were present. Messrs. F. G. Breyer, M. L. Crossley, B. H. Knight, H. G. Knight, R. J. Moore, H. S. Neiman, W. T. Read, C. W. Rivise, A. Rogers, N. A. Shepard, M. Toch, L. Van Doren, and F. W. Zons. Miss V. F. Kimball was also present.

The minutes of the previous meeting were approved.

The Treasurer's report, showing a cash balance on hand of $963.23, was read and accepted.

Dr. H. G. Knight reported that he had conferred with the Washington Chapter and recommended that this Chapter should include members from Maryland, Virginia, and the District of Columbia, with the understanding that part of Maryland should be turned over to a Baltimore Chapter, if a Baltimore Chapter should be formed at some future time. Upon motion made and seconded, this report was adopted.

The Secretary read a telephone message from the Secretary of the Chemists' Unemployment Committee, recommending that the Park Department of the City of New York employ several chemists. Dr. Toch offered to write to the Superintendent of Parks regarding this matter.

A letter from the Special Libraries Association requesting the INSTITUTE to supply copies of its technical papers read at meetings, etc., was presented, and the Secretary was requested to send such papers and THE CHEMIST to this Association.

The Secretary was requested to bring the matter of a possible change in the name of the INSTITUTE before the next Annual Meeting.

A letter from Murray M. Rubin, F.A.I.C., regarding life membership was read, and upon motion made and seconded, the matter of life membership was referred to the Annual Meeting.

President Toch presented a letter from Mr. J. N. Taylor, which referred to the recent survey undertaken by the Department of Labor for the Engineering profession. After discussion, Mr. Frank G. Breyer was appointed a committee of one to investigate the possibilities of having such a survey made for the chemical profession.

Dr. Toch reported his activities in connection with a bill to license chemists now before the State Legislature and appointed Mr. Robert J. Moore and Dr. M. L. Crossley to coöperate with the American Chemical Society in reference to this bill.

The following new members were elected:

FELLOWS

THOMAS J. FINNEGAN, *Chief Chemist*, New York Steam Corporation, New York, N. Y.

WILLIAM W. HAWES, *Chemist*, Union Carbide and Carbon Research Laboratories, Niagara Falls, N. Y.

CARL O. JOHNS, *Chemical Consultant*, 1160 Fifth Avenue, New York, N. Y.

E. H. KESSLER, *Consulting Chemical Engineer*, The Thresher Varnish Co., Dayton, Ohio.

DANIEL D. RUBEK, *Chief*, Technical Naphtha Service, Anderson-Prichard Oil Co., Chicago, Ill.

DONAVAN J. SALLEY, *Research Chem-*

ist, American Cyanamid Co., Stamford, Conn.

HAROLD J. TORMEY, *Professor of Chemistry and Head of the Department of Chemistry*, St. Bonaventure College, St. Bonaventure, N. Y.

A. E. VERBYLA, *Chemist*, Standard Varnish Works, New York, N. Y.

LOIS W. WOODFORD, *Assistant to the Director*, American Cyanamid Company, 1937 Main Street, Stamford Conn.

ASSOCIATES

E. W. KOENIG, *Directors of Research* Consolidated Feldspar Corp., Erwin, Tenn.

JUNIORS

MAURICE FRIEDMAN, *Graduate Student*, New York University, New York, N. Y.

WILLIAM R. GOLDWATER, *Junior Research Chemist-Engineer*, Wecoline Products Company, Boonton, N. J.

FRED H. HAFNER, *Chemist*, Archer Daniels Midland Co., Buffalo, N. Y.

Mr. Frank G. Breyer reported for the Committee on Unemployment and Relief, followed by discussion of plans for carrying on this Committee next December. Mr. M. R. Bhagwat, Secretary of this Committee, was present during this discussion to contribute such information as might be needed about the operation of the Committee. Upon motion made and seconded, Mr. Breyer was appointed chairman, with Drs. W. T. Read, N. A. Shepard, and R. J. Moore as members, of a committee to make preparations for taking over the Unemployment Committee.

There being no further business, adjournment was taken.

CHAPTERS

New York

Chairman, William T. Read *Vice-chairman*, D. D. Berolzheimer
Secretary-treasurer, James W. H. Randall
52 East 41st Street
New York, N. Y.
Council Representative, Frederick W. Zerban

A meeting of the New York Chapter was held at The Chemists' Club, April 23, 1937.

Dr. Maximilian Toch, president of THE AMERICAN INSTITUTE OF CHEMISTS, spoke on "Scientific Detection of Fraud". Known for many years as one of the outstanding art experts in this country, Dr. Toch fascinated his audience with accounts of fakes and forgeries of Old Masters. Among the methods of determining the genuineness of a painting are the tests of photomicrography, ultra-violet and infra-red photography, and chemical analysis of pigments. Many paintings today exhibited in museums and private collections as genuine are actually clever forgeries. Two thousand pictures supposed to be by Van Dyck are in existence, although Van Dyck painted but seventy during his lifetime. A "Velasquez" submitted to Dr. Toch revealed that its blue pigment was ferrocyanide of iron, discovered in 1704. Velasquez, however, died in 1660, and the blue he used in his paintings was composed of powdered lapis lazuli stones. Following other accounts of the work of science in the detection of forgeries of Old Masters, Dr. Toch emphasized the superiority of accurate scientific information over the method of inspection and knowledge of style formerly depended upon to determine whether a painting was genuine.

Niagara

Chairman, Howard W. Post *Vice-chairman,* William R. Sheridan
Secretary-treasurer, Luther M. Lauer
98 North Buffalo Street
Orchard Park, N. Y.
News Reporter to THE CHEMIST, W. A. Smith
Council Representative, Arthur W. Burwell

At the March meeting of the Niagara Chapter, Mr. Frank G. Breyer, F.A.I.C., spoke on the "Profession of Consulting Chemist". He also mentioned the work of the Committee on Unemployment for Chemists in New York City. It is the ambition of the committee to have a complete classified listing of chemists. No such information is now available, with the result that there is over-production of one type of chemist, and under-production of another. The heavy chemicals field is over-supplied with chemists at present, while the organic synthesis field is under-supplied with chemists. A permanent problem seems to exist in the employment of men over forty-five, regardless of the fact that much of the great work in chemistry has been done by men over that age. Another job of the committee is to get square pegs into square holes, and round pegs into round holes. The prosperity cycle is of longer duration than the mere "puff" that some people think it is.

The thesis of Dr. Breyer's talk was that a healthy and well-organized group of consulting chemists and chemical engineers is necessary to the profession. During the past seventeen years, problems have been transferred from the consulting chemists to the staffs of commercial companies, a practice which has occurred generally. Questions arise immediately. Is this good or bad for industry or for the profession of chemistry? The profession involves knowledge, the application of knowledge, and the ability to collect, coördinate, and sell that knowledge to the public. Chemists must stand on their own independent feet. Most chemists want a job. With a healthy, well-organized professional consultant group, they would be independent. Chemists must be put into a position to be ready to take care of themselves under all circumstances. No medical men received the dole. A profession of consulting people will go a long way to furnish the necessary cushion for the chemical group.

A professional group is now a real need, it must be recreated. We must have independents to get the profession onto a real basis.

The present tendency of colleges is to turn out an excess of average or lower grade men. The oversupply reduces the value of these chemists. Many of them have to sell their brain children for $5.00 via the patent contract. Inventors should have rights. At present the patent corporation get a big slice. The patent bar comes next. The patent entrepreneur next, and the inventor is a poor fourth.

The Science Advisory Board is trying to fix a lot of defects. It suggests (1) the publication of proposed patents, allowing citation of prior act to patent examiner. (2) Establish one single patent court of appeals, where the judges are technically trained. (3) This patent court of appeals is to be advised by technical men.

An independent, consulting group can foster this, a company man can not, so a professional group is necessary here too. One factor must be considered.

The college attitude must be changed. The present colleges are for science for science's sake. This attitude is too abstract. There should be a practical course, also, to prevent disillusionment.

The first pre-requisite is the organization of the profession. The standing of the chemist must be raised. The unsuited must be excluded. Qualifications must be raised legally, that is, they must be embodied in a law. The production of chemists must be restricted by raising the qualifications, and by informing the schools what type of chemist is needed, and what type is not needed. Chemists should associate with the founder engineering societies. The engineering groups are willing to coöperate — we should not stand aloof. Chemists must throw off the domination of the academic mind, again following the lead of the engineering profession. Ninety-five per cent of the profession of chemistry is in corporate employ. We must stand together for our own good.

The Annual Meeting of the Niagara Chapter was held at the General Brock Hotel, Niagara Falls, Ontario, on Friday evening, April 30, 1937. Twenty seven members were present.

Dr. L. M. Lauer, Chairman of the Committee on Education, introduced the 1937 student medalists of the Chapter: Joseph H. Lynch, Niagara University; Louis A. Rampino, Canisius College, and John M. Swartout, University of Buffalo.

The election of the following new officers was announced: Chairman, Dr. H. W. Post; Vice-Chairman, Dr. William R. Sheridan; Secretary-Treasurer, Mr. Luther M. Lauer; Representative to National Council, Dr. Arthur W. Burwell; Alternate to National Council, Mr. Maurice C. Taylor; Chapter Reporter to THE CHEMIST, Mr. W. A. Smith.

An informal symposium was then held on the subject of a "Research Institute for the Niagara Frontier". The first speaker was Mr. Frederic L. R. Sievenpiper, who discussed other similar projects, particularly the commercial developments resulting from experimental research at Mellon Institute. "The chemist does not need to find new compounds. He needs to find what to do with the old ones."

The second speaker was Dr. Groves H. Cartledge, who mentioned the scope of work and projects which such an institution might undertake. For example, non-restricted projects are those of the Mellon Institute; restricted projects are those of the Rockefeller Institute. In the Niagara area a restricted type of institute would seem feasible for problems such as: (1) High temperature pressure reactions (ideal place for this project). (2) Extreme purification of commercial commodities produced in this district. Such a laboratory would have to be endowed to provide facilities not usually found, such as X-ray equipment, etc., which would be too expensive for a commercial laboratory.

Mr. William L. Hyden discussed the personnel for industrial chemical research. There should be supervisors, chemists, and assistants. All true researchers should have a problem, a thirst for knowledge; honesty, sympathy, devotion to problem, and hence must have (a) the will to be a researcher: (b) training for the work; (c) persistance in following to the end; (d) highest character and personality. A real researcher must think, calculate, plan, experiment, and think. He must also have the ability to sell his results to the management, so that developments will result in application.

The fifth speaker was Mr. John E. Seubert, who discussed the administra-

tion and finance of such an Institute. Officers, Board of Trustees, and a Research Director, would be required.

Dr. Alvin F. Shepard spoke on the attitude of industry to such an Institute. The smaller companies could carry on research beyond their own ability to carry out their projects. Large corporations sometimes support pure scientific research, which is most easily done in a non-commercial institution.

Dr. Arthur W. Burwell continued the discussion of the attitude of industry to such a research institution. Small concerns are suspicious of patent work and would have to be "sold" on the idea. The problem would be to collect the necessary endowment and would require careful handling by several interested parties with the necessary public spirit to put the idea across.

Pennsylvania

Chairman, Joseph W. E. Harrisson *Vice-chairman*, Lewis D. Newitt

Secretary-treasurer, Avenir Proskouriakoff
67 Fairview Avenue
Lansdowne, Penna.

Council Representative, Charles W. Rivise

The members and friends of the Pennsylvania Chapter of THE AMERICAN INSTITUTE OF CHEMISTS visited the Test Laboratory of the U. S. Navy Yard, Philadelphia, Pa., on March 13, 1937, and were received by members of the INSTITUTE employed at the Navy Yard. As it was believed very few of the guests had a clear conception of the magnitude and seriousness of the work required in a Government laboratory, a short description of the laboratory and its functions was given by Mr. Joseph E. Chapin, F.A.I.C., the chief chemist.

The Chemical Laboratories in the U. S. Navy Department now have something over forty years of service life, the Navy Department being one of the first large organizations to show applied interest in the testing of technical materials that were to be used for engineering applications. The Brooklyn Navy Yard Chemical Laboratory had been organized more than thirteen years before a Chemical and Metallurgical Laboratory was established in the Philadelphia Navy Yard, in 1910. The Norfolk and Washington Navy Yards had Chemical Laboratories before 1906.

The Navy Department had designated the Philadelphia Navy Yard as the central storehouse and distributing point for all stocks of tool steel and to function effectively in this capacity it was necessary to establish a local chemical laboratory. For some years, prior to 1910, a chemist at the Brooklyn Navy Yard was assigned to do such work as was required by the Philadelphia Navy Yard. The Philadelphia Navy Yard Chemical Laboratory was started in 1910 with one chemist, in 1915 there were three chemists, 1918 and the war increased the number to fifteen, and we still have a large group of employees doing analytical or other testing work. Most of the employees have bachelor degrees in chemistry, and several have one or more of the higher degrees.

The Navy Department is a large consumer of engineering materials, textiles, foods, drugs, and other products of American industry. The purchase problems are beyond comprehension or adequate description. The money value of purchased materials is enormous. Government methods of

purchase are regulated strictly by law and all accounts are very carefully audited to cover requisitions, bids, and payment of bills for accepted materials. Contractors are not always sincere and conscientious as to the quality of the material they offer for delivery and for which they hope to be paid by the Government. Defective or inferior materials are expensive at any cost and may be responsible for the loss of a ship, the crews, or even a battle. Every possible precaution must be taken to insure all materials being designed to meet the particular service requirements. There are many applications where the best available materials are not adequate to stand the severe service conditions. The power plants aboard ships depend upon good water and satisfactory fuel to develop power as may be needed in an emergency. Signal systems, ordnance and every detail aboard ship must be in operating condition at all times. Care and preservation problems are under study at all times.

An organization of the magnitude of the Navy involves intricate operating details. All kinds of stores must be available when and where needed and strict regulation has to be followed at all times. The materials used have to be manufactured in industry, Government inspected before shipment or delivery, and delivered where needed on a scheduled time. A few thousand men might not have necessary food on time, and men cannot work or fight without proper nourishment. The laboratories are directly concerned with the quality of these various materials, and as you can see, have facilities to make rather complete and necessary tests. The laboratories at the various Navy Yards each have some particular types of materials as specialties, and at this Yard we test all the tool steel, die casting alloys, batteries, asphalts, kapok, curled horse hair, mattress cotton, and many other products, no matter where they may be manufactured or purchased. We also get all kinds of materials made in this Naval District.

In selecting tool steels and awarding contracts for these materials it is very necessary to know the ultimate that is available commercially. Freak materials that are not in production may be interesting to show what might be available at a later date, but contracts have to be based on materials that are in commercial production. Our specifications for tool steels are based on commercial materials that have been given severe work value tests and careful chemical analysis. All deliveries must have the essential composition of the samples used to establish acceptability. Satisfactory plus and minus tolerances are mutually agreed upon and all deliveries must then meet these tolerances for composition. The details are necessary to insure uniformity and make adequate and necessary heat treatment in the shops possible. The composition of steel regulates the heat treatment necessary to manufacture satisfactory tools. Steels used for machine tools, milling cutters, drills, chisels, punches, dies, etc., are all very carefully inspected at the place of manufacture for physical properties and defects before being tested for composition. Drills and milling cutters are frequently purchased ready for use and these tools are constantly being given service or work value tests. The tests developed by the Navy Department have markedly improved the quality of tools offered to the Department and industry has been benefited indirectly by these improvements. Large industrial consumers of these materials have found it to their advantage to demand "Navy Quality".

We may not all use curled horse hair mattresses in our homes and we would hesitate to open our upholstered furniture to examine the under cover filling. The Navy uses some quantities of curled horse hair and every lot offered for delivery is very carefully examined for the type of hair, the length of fibers is actually measured, the hair tested for artificial color, general quality, curliness, dirt, adulterants, and whether it is new or used hair. Few of us know what we are using or have any means of finding out what we have paid for in these products.

Many of us use electric storage batteries, but invariably we buy anything on the market at what seems an interesting or reasonable price. This practice would soon cause disaster with batteries used in the Navy, whether it be in aviation or in submarines. We must have dependable batteries with a number of years of assured service life, and careful testing is necessary to maintain this service.

The ships we are now building are being welded together rather than being riveted as in former years. This change in construction practice demands changed qualities in the steel plates and castings, with rigid inspection for defects and composition. The newer steels, known to the public as corrosion resisting steel, are all more expensive, and if they are to render service in proportion to their cost they have to be carefully made and carefully fabricated or the high costs are not justified in service. Aluminum and aluminum alloys all have to be carefully controlled for composition to insure a satisfactory service. What has been said about these few materials applies equally well to many other products. If it were not for the laboratories in the Navy Department it would not be possible to build the ships we need to protect our country.

Following the above description of the function of the Navy Department laboratories the guests were separated into small groups and personally conducted through the laboratory. The air conditioned room, which is maintained at seventy degrees F. and sixty-five per cent relative humidity, with equipment for testing textiles, paper, rubber and paints, was explained and the equipment demonstrated. In the electrolytic room, where twenty-five independent electrolytic determinations of copper are made at one time, an electrolysis of copper was demonstrated. Potentiometric titration equipment for use in oxidation and reduction volumetric analysis was demonstrated and discussed. Several samples of special alloys like beryllium copper, ferro-columbium, lead-tellurium, and silver-cadmium were on display. The room used for testing petroleum products, solvents, and industrial gases seemed to be of special interest. The all-aluminum tanks and piping system for the storage and distribution of distilled water was a new application as most chemists still use block tin equipment for distilled water. The balance room with some modern analytical balance seemed to be of more than average interest to the guests. In the physical testing of metals and alloys the equipment for determining tensile strength, elongation, and reduction of area was effectively demonstrated and described. Gamma ray photographs of heavy steel sections were on display, a large metallurgical microscope and binocular microscope for study of metal structure were demonstrated. A large petrographic microscope, showing the effect of polarized light in the identification of unknown materials was of special interest. The effect of ultra-violet light on many different materials was

shown. The equipment for the determination of hydrogen ion concentration with either glass or platinum electrodes was on display.

A large Litrow spectrograph with the necessary accessories to make qualitative and quantitative analysis of many materials was described in detail and demonstrated. From the general reaction of the guests it is possible that most of them would liked to have spent the whole afternoon in the spectrographic demonstration. Negatives were displayed and explained, the measurement of the wave length of unknown lines was described, and measurement of the density of the line used in quantitative analysis was demonstrated.

The members of the Philadelphia Chapter of THE AMERICAN INSTITUTE OF CHEMISTS wish to take this opportunity to thank the Commandant, the Manager and the Test Superintendent at the Philadelphia Navy Yard for making this interesting and educational inspection visit possible.

Washington

Honorary President, Charles E. Munroe *President,* Louis N. Markwood
Vice-President, Norris W. Matthews *Treasurer,* James B. Martin

Secretary, A. P. Bradshaw
2121 New York Avenue, Washington, D. C.

News Reporter to THE CHEMIST, James F. Couch
Council Representative, Louis N. Markwood

OUR NEW MEMBERS

PIERREPONT ADAMS, J.A.I.C., is a graduate of Johns Hopkins University. He is employed as chemist by the American Cyanamid Company at its laboratories at Stamford, Conn.

LEWIS APPLETON, A.A.I.C., holds the A.B. degree from Harvard University and the M.S. degree from New York University. He prefers the fields of physical, inorganic chemistry, and electrochemistry, and is the author of several technical papers on the latter subject. He is chemist for the Solar Manufacturing Company, New York, N. Y.

KENNETH F. ATWOOD, F.A.I.C., was graduated from Bowdoin College. He specializes in formulation and analytical work in the paint and varnish industry, and is chemist with the Gilbert Spruance Company, Philadelphia, Pa.

BERNARD HOLBROOK BAILEY, F.A.I.C., received the Ph.D. and M.S. degrees from Yale University. He is author or co-author of two technical papers, and specializes in paints, oils, and varnishes, particularly the development of alkali resistant paints. He is assistant superintendent of the Flooring Division of Bird and Son, Inc., East Walpole, Massachusetts.

ROBERT S. BARNETT, F.A.I.C., obtained the Sc.B. degree from Southwestern Louisiana Institute, and the Sc.M. degree from New York University. He is the author of several technical publications. His specialty is grease

and compounded lubricant analysis and grease research. He is employed by The Texas Company as research chemist in its Beacon Research Laboratories at Beacon, N. Y.

PAUL H. M. P. BRINTON, F.A.I.C., received the Ph.D. degree from the University of Minnesota. He specializes in analytical, physical and inorganic chemistry, and rare elements. He is consulting and research chemist, with offices at 1064 Linda Vista Way, Pasadena, California.

ANDRÉ E. BRIOD, F.A.I.C., received a degree from the Gymnase Scientifique, Lausanne, Switzerland, and has also studied at Lausanne University, and at Cornell University Graduate School. He is the author of several papers, and specializes in the chemistry and technology of fats and oils, and in food chemistry and vitamins.

PAUL DEMERITT BUCKMINSTER, F.A.I.C., holds the B.S. degree from the University of New Hampshire. He is the author of several technical papers on China-wood oil and cost accounting problems. He specializes in plant management and technical control. His position is general superintendant of the General Paint Corporation, San Francisco, Calif.

LEO P. CHEBOTAR, F.A.I.C., was graduated from the Institute of Technology at Petrograd, and received the doctor's degree from the University of Naples, Italy. He specializes in petroleum, oils, fats, and soap, dyestuff intermediates, and the science of technical research. He holds three patents and is the author of an article on "Oxidation Under Pressure". At present, he is employed by the Water Supply Department of New York City.

FRANK L. CHINERY, F.A.I.C., is a graduate of the University of Kansas. He specializes in paints and varnishes. His position is research chemist with the Eagle Picher Lead Company, Cincinnati, Ohio.

LAUCHLIN MACL. CURRIE, F.A.I.C., is a graduate of Davidson College, and of Cornell University, from which he received the Ph.D. degree. He holds several patents and specializes in thermo plastic resins and fabricating equipment, and dry batteries. He is director of the New Products Division of the National Carbon Company, Inc., Cleveland, Ohio.

ARNOLD R. DAVIS, F.A.I.C., is a graduate of Massachusetts Institute of Technology. He specializes in plant control and development in the rubber industry, and is chemist in charge of the rubber section of the Technical Service Laboratory of American Cyanamid Company.

ALBRECHT A. DOUGLAS-SAUERMANN, F.A.I.C., was educated at the Kaiser-Wilhelm Akademie, the University of Czernovitz, and the Polytechnical Institute at Dresden. He specializes in medical research work and is the author of several papers. He is doing research work in his own laboratory on the etiology of gall-stones. His address is 157 West 78th Street, New York, N. Y.

EDWARD G. EGAN, J.A.I.C., received the B.S. degree from the University of North Carolina, and is now a purchaser of chemicals for the Franco-American Chemical Works, New York, N. Y.

EMIL C. FANTO, F.A.I.C., studied at the University of Vienna and obtained the Ph.D. degree from the University of Heidelberg. Author of one publication and holding several patents, his preferred chemical fields are analytical chemistry, pharmaceuticals, food, and cosmetics, analysis and research, petroleum products, and manufacturing. He is chief chemist for McKesson and Robbins, Inc., Bridgeport, Conn.

THOMAS J. FINNEGAN, F.A.I.C., has studied at Columbia University, Brooklyn Polytechnic Institute, and New York University. He is the author or co-author of seven articles in his preferred fields of corrosion, water conditioning, fuels and combustion, flue gas treatment, and other power plant problems. He is chief chemist with the New York Steam Corporation, New York, N. Y.

THOMAS C. FORD, F.A.I.C., holds two degrees from Armour Institute of Technology, and the A.M. degree from Columbia University. He specializes in paints and varnishes, and asphalt and asphalt paving, and has two patents in these fields.

MAURICE FRIEDMAN, J.A.I.C, obtained the A.B. degree from New York University, and is now a graduate student at that university. His preferred fields are inorganic, physical chemistry, and analytical chemistry.

WAYNE R. FULLER, F.A.I.C., received the B.S. degree from the University of Missouri. Specializing in paint and varnishes, he is manager of industrial research for Devoe and Raynolds Company, Inc., Louisville, Kentucky.

HENRY I. GILBERT, F.A.I.C., studied at Oxford, England, and at Cooper Union. He specializes in production in the paint and varnish industry, and is vice-president and general manager of Capitol Paint and Varnish Works, Inc., Brooklyn, N. Y.

WILLIAM RALPH GOLDWATER, J.A.I.C., holds the B.S. and Ch.E. degrees from the College of the City of New York. Particularly interested in electrochemistry, physical chemistry, and oils, he is junior research chemical engineer with Wecoline Products Company, Boonton, N. J.

FRED H. HAFNER, J.A.I.C., is a graduate of the University of Buffalo. He specializes in proteins and amino acids, soya bean oil and linseed oil, and aromatic-oximino research. He is employed as chemist by the Buffalo Division of Archer Daniels Midland Company, Buffalo, N. Y.

CECIL J. HAGGERTY, F.A.I.C., obtained the A.B. degree from the Williams College and the Ph. D. degree from Johns Hopkins University. Author of two technical articles, he specializes in physical chemistry and electro-organic chemistry. He is professor of chemistry at Holy Cross College, Worcester, Mass.

WILLIAM H. HARDING, F.A.I.C., obtained the B.S. degree from Massachusetts Institute of Technology. He specializes in the manufacture and use of paper chemicals, the utilization of pulp and paper by-products, and paper chemistry, including coating, and holds two patents on a rosin size. He is head of the paper chemicals division of the Technical Service Laboratories of the American Cyanamid Company, Stamford, Conn.

HAL R. HARLAN, F.A.I.C., has studied at Missouri State University, Notre Dame, the University of Southern California, and the University of California. He specializes in iron pigments, color photography and photo micrography, and is the author of two articles on these subjects. He is technical director of Hal R. Harlan Associates, San Francisco, California.

WILLIAM W. HAWES, F.A.I.C., has studied at Franklin College, Purdue University, and Brown University, from which he obtained the Ph.D. degree. Specializing in the physical chemistry of solutions, he is the author of two papers on the subject. His position is chemist with the Union Carbide and Carbon Research Laboratories, Inc., Niagara Falls, N. Y.

HARRY A. HOFFMAN, F.A.I.C., is a graduate of Colgate University. He holds one patent, and is co-author of "Colloid Developments in Synthetic Resins." He is research chemist for the Bakelite Corporation, Bloomfield, New Jersey.

ROBERT ELLIOTT HUSSEY, F.A.I.C., received two degrees from the University of Maine and the Ph.D. degree from Harvard University. Specializing in organic chemistry, he is author or co-author of a number of publications. He is professor of organic chemistry at Virginia Polytechnic Institute, Blacksburg, Va.

CARL O. JOHNS, F.A.I.C., received three degrees from Bethany College, and two degrees (including the Ph.D. degree) from Yale University. Specializing in organic, biological, and petroleum chemistry, he holds two patents, and is the author of ninety-two published papers. He is chemical consultant to the Standard Oil Company of New Jersey.

PETER C. JURS, A.A.I.C., obtained the Ph.D. degree from Stanford University. Author of several papers, he specializes in organic chemistry, glycoside analysis, urea-formaldehyde resins, and synthetic organic chemistry. He is organic research chemist with the American Cyanamid Company, Stamford, Conn.

E. H. KESSLER, F.A.I.C., received the D.Sc. degree from the University of Dayton. Specializing in physical and colloidal chemical phenomena, paint research, and biological research, he is consulting chemical engineer for the Thresher Varnish Company, Dayton, Ohio.

E. W. KOENIG, A.A.I.C., specializes in the analysis of silicate materials,

the correlation of chemical and physical characteristics of ceramic materials, and is the author of four technical articles on feldspar. He is director of research and chief chemist for the Consolidated Feldspar Corporation, Erwin, Tenn.

WILLIAM P. LAWLER, J.A.I.C., was graduated from the Polytechnic Institute of Brooklyn, and is employed as analytical chemist by the Nichol Copper Company, Maspeth, Long Island, New York.

WALTER H. LINDENTHAL, F.A.I.C., holds two degrees from the Polytechnic Institute of Brooklyn. Co-author of a paper on the "Tyler Electric Still", he specializes in salt manufacture and synthetic plastics. He is chemist with the Bakelite Corporation, Bound Brook, N. J.

DARREL E. MACK, J.A.I.C., received the B.S. degree from Purdue University, and is now employed as research chemist with the Niacet Chemicals Corporation, Niagara Falls, N. Y.

KENNETH V. MCCULLOUGH, F.A.I.C., studied at North Dakota State College from which he received the B.S. degree. His work has been chiefly in the development of paint and enamel products. His position is chemist with the Bakelite Corporation, Bloomfield, N. J.

SIMON MENDELSOHN, F.A.I.C., has studied at Ohio Mechanics' Institute of Applied Arts, Queen City College of Pharmacy, and Lebanon University. Specializing in analytical chemistry, microscopy, foods and drugs, and chemical specialities, he is the author of twenty-two articles. He is chief chemist for the Snow King Baking Powder Company, Cincinnati, Ohio.

GEORGE B. MURPHY, F.A.I.C., obtained B.S. and Ch.E. degrees from Columbia University. Specializing in cracking and petroleum refining in general, he has many patents and publications in that field. He is manager of the research and development laboratories of Universal Oil Products Company, Riverside, Illinois.

HENRY H. NELSON, F.A.I.C., is a graduate of North Dakota State Agricultural College, and Harvard Graduate School of Business. He specializes in varnish, lacquer, and synthetic resins, and factory organization, and is the author of several technical papers in these fields. He is employed by Sherwin Williams Company, Newark, N. J. in its technical service department.

LAWRENCE A. O'LEARY, F.A.I.C., studied at North Dakota State College and then at the University of Notre Dame, from which he received the Ph.D. degree. His specialty is paint, varnish, and lacquer chemistry and technology. He is the author of one technical paper. W. P. Fuller and Company, San Francisco, California, employ him as research chemist.

HOWARD W. PHELPS, F.A.I.C., received the B.S. degree from Cooper Union. Specializing in electrolytic processes, he is chemist with the Electrographic Corporation, New York, N. Y.

DONALD PRICE, F.A.I.C., received three degrees, including the Ph.D. degree from Columbia University. He is the author of several technical articles, and specializes in microanalysis and synthetic organic chemistry. He is research chemist with National Oil Products Company, Harrison, New Jersey.

JOHN M. PURDY, F.A.I.C., was graduated from DePauw University, and from Ohio State University, receiving the Ph.D. degree from the latter. He is the author of three technical articles in his preferred field of paints and varnishes. His position is chief chemist with The Lowe Brothers Company, Dayton, Ohio.

LANNING P. RANKIN, F.A.I.C., obtained three degrees, including the Ph.D. degree, from the University of Kansas. He has assigned approximately a dozen patents to the Hercules Powder Company. His specialty is the field of physical chemistry and thermodynamics. He is research chemist for the Bakelite Corporation, Bloomfield, N. J.

ROBERT E. RAUH, F.A.I.C., received commercial and chemical training in Germany. He specializes in resinous products, and is president and treasurer of Robert Rauh, Inc., Newark, N. J.

ANTHONY J. REVUKAS, F.A.I.C., received the M.S. degree from the Polytechnic Institute of Brooklyn. He is particularly interested in organic chemistry, practical insulating oil chemistry, lead cable sheath corrosion, development of analytical procedures applicable to the electrical power industry, and applied cosmetic chemistry. He is the author of one technical paper, and is employed as laboratory assistant by the Brooklyn Edison Company, New York.

DANIEL D. RUBEK, F.A.I.C, received the B.S. degree from Iowa State College. He is co-author of several papers in his chosen field of paint, varnish, and lacquer technology, and the application of petroleum thinners. He is chief of the Technical Naphtha Service of Anderson-Prichard Oil Corporation, Chicago, Ill.

DONOVAN J. SALLEY, F.A.I.C., is a graduate of the University of North Dakota, and of Princeton University from which he obtained the Ph.D. degree. Author of many technical articles, he specializes in photochemistry, adsorption, catalysis, and the physical chemistry of cellulose. He is research chemist with American Cyanamid Company, Stamford, Conn.

JOHN McE. SANDERSON, F.A.I.C., obtained the B.S. degree from Lehigh University. He is the author of numerous technical articles in the field of paint, varnish, lacquers, and synthetic resins. He is sales engineer with American Cyanamid and Chemical Corporation, New York, N. Y.

GEORGE B. SAWYER, F.A.I.C., was graduated from the Case School of Applied Science. He specializes in paint, varnish, and lacquer, and in the development research and sales thereof, as technical director of Ferbert Schorndorfer Company, Cleveland, Ohio.

SAMUEL SCHENBERG, F.A.I.C., has studied at the College of the City of New York; at Massachusetts Institute of Technology from which he received the S.B. (in Ch.E.) degree; at St. Lawrence University, from which he obtained the L.L.B. degree, and is now preparing for an M.A. degree at New York University. He specializies in the education of the high school student, and as a consultant to attorneys on chemical matters. His position is instructor of chemistry at Bay Ridge High School, Brooklyn, N. Y.

F. GRANT VON M. SCHLEICHER, F.A.I.C., obtained the M.Sc. degree from Cornell University and has also studied at Columbia University. He specializes in printing inks, varnishes, and compounds. He is chemist, vice-president, and director of W. D. Wilson Printing Ink Company, Long Island City, New York.

SOLOMON D. SCHNEIDER, A.A.I.C., has the B.S. degree from New York University. He specializes in sanitary chemistry, clinical chemistry, and engineering chemistry, and is laboratory assistant in the chemical laboratory of the Bureau of Sewers and Highways of New York City.

CLYDE A. SLUHAN, A.A.I.C., is a graduate of Ohio Wesleyan University. His position is textile chemist with American Cyanamid Company, Stamford, Conn.

CARROLL R. SUTTON, F.A.I.C., holds the B.S. degree from the University of Michigan. He is the author of one article in his preferred field of paint, varnish and lacquer chemistry. He is in the sales development department of Commercial Solvents Corporation, Terre Haute, Indiana.

FARRIS S. SWACKHAMER, J.A.I.C., was graduated from Rutgers University, and has also studied at Brooklyn Polytechnic Institute. He specializes in microanalysis and is employed as chemist by the American Cyanamid Company, Stamford, Conn.

HAROLD J. TORMEY, F.A.I.C., received two degrees from the University of Wisconsin and has also studied at the University of Chicago. He specializes in organic chemistry, synthetic drugs, petroleum chemistry, and chemistry in crime detection, and is the author of more than twenty technical articles. He is professor of chemistry and head of the Department of Chemistry, St. Bonaventure College, St. Bonaventure, New York.

A. E. VERBYLA, F.A.I.C., is a graduate of Cornell University. Specializing in lacquers, he is employed as lacquer chemist by the Standard Varnish Works, New York, N. Y.

JAMES H. WILLIAMS, F.A.I.C., studied at Worcester Polytechnic Institute, and obtained the Ph.D. degree from New York University. He specializes in organic chemistry, patent law, and chemotherapy. His position is research chemist with American Cyanamid Company, Stamford, Conn.

ROBERT I. WISHNICK, F.A.I.C., received the B.S. degree from Armour Institute of Technology, and the B.L.L. degree from the Chicago Kent College of Law. He organized Wishnick-Tumpeer, Inc., New York, N. Y., and is still acting as its president and treasurer. He is also president of Panhandle Carbon Company, Inc., Pioneer Asphalt Company, and Witco Carbon Company; treasurer of Witco Oil and Gas Company, and director of Witco Limited, London.

LOIS W. WOODFORD, F.A.I.C., obtained the B.A. degree at Mt. Holyoke College. She specializes in administrative work in chemical organizations, and holds a patent for a method of staining fibrous bodies. She is assistant to the director of the Technical Service Laboratory of American Cyanamid Company, Stamford, Conn.

NEWS

Dr. Emmett B. Carmichael, F.A.I.C., Head of the Physiological Chemistry Department, School of Medicine, University of Alabama, read a paper on "Rattlesnake Venom" before the Chemists' Club, of Chattanooga, Tennessee, on Friday evening, March 26th. He also gave a paper on the life of Dr. La Fayette Guild before the science students of the University of Chattanooga on the afternoon of March 26th.

"Creative work in science teaches young people straight thinking and in addition affords all the recreation and artistic expression to be found in the arts," declared Gerald Wendt, F.A.I.C., director of The American Institute of the City of New York, in announcing two hundred and twenty-six winners of cash prizes at the very successful Children's Science Fair held in New York. "Our world today is certainly based on science and in the days to come this understanding of the world will be more and more necessary. This original, voluntary, creative work is the real way to learn. It is education at its best. These youngsters are not learning only about electrons and chemicals and cells; they are learning to think straight. Their work is not only education but recreation and artistic expression, too, and above all it builds their minds and character."

William M. Malisoff, F.A.I.C., spoke on "Chemistry—Good and Bad" at a meeting of the Chemistry Teachers' Club, held in New York, May twenty-first.

Gustav Egloff, F.A.I.C., left on June second to attend the Second World Petroleum Congress at Paris, June fourteenth to nineteenth, as president of the American Refining Division and of the American delegation to the Congress, and as delegate from the

American Petroleum Institute. He will spend a week in England lecturing before the Institution of Petroleum Technologists at the Royal Society in London, University of Manchester, Llandarcy, Wales, and the University of Edinburgh; then going on to the Second World Petroleum Congress at Paris, where he will give five papers. He will also spend some time in Holland, Belgium, Germany (attending the Achema Chemical Exposition and the German Chemical Society meeting), Czechoslovakia, and Austria, visiting refineries and oil fields in addition to giving lectures. He will return about August first.

Florence E. Wall, F.A.I.C., addressed the Chemistry Club of Hunter College, New York, N. Y., on, "Ways of Utilizing a Chemical Education" at its meeting held on April twenty-third.

Political Chemistry

"In both the minimum-wage and Wagner act decisions, 'the Constitution' shifted color like a piece of litmus paper when Mr. Justice Roberts changed over night from constitutional acid to constitutional alkaloid."

—*New York Post*

CHEMISTS ABROAD

By James N. Taylor, F.A.I.C.

"THE Chemist in Industry: His Induction and Functions" was the subject discussed by C. M. Whittaker, B.Sc., at a symposium held at Grand Hotel, Manchester, on April second. Mr. Whittaker said he was not in accord with an arbitrary salary delimitation based upon specified academic qualifications for several reasons. It ignores personality and common sense; it creates a dead-end for a large class of people which is very undesirable; there is a possibility of introducing a snobbish caste into the organization which is again very undesirable.

In my experience, he said, there are just as many fools walking about with high academic qualifications as there are able men walking about with lesser academic qualifications but of greater ability and deserving of greater financial reward . . . .

It is the function of all chemists whether research or production to apply their knowledge with commonsense . . . The chemist should also be able to sense his environment because modern industrial organization has created environments which favor the type known as "Yes" men. By that, he remarked, I mean a man who is able to guess the answer which his superior requires and gives him it whether he believes it or not . . . When a chemist finds himself in such an environment whether he decides to stay in such an environment or leave it depends whether he wishes to be captain of his own soul.

One of my chiefs, said he, used to question me by a roundabout route which I used to short-circuit by saying, "Tell me what you want me to say and I will tell you if I can say it." However, I decided early in my life that I would be captain of my own soul, and looking back there have been occasions when it has retarded promotion.

I would say most emphatically that it is not the function of any chemist to be the worst dressed man in the organization. I know some positions are rough on clothes but some chemists are far

too prone—even to the point of posing—to make a feature of being badly dressed. If the management is looking for a man to promote, it is not often the most badly dressed man who is promoted.—*The Dyer & Textile Printer, (London).*

GOVERNMENT Technique in Official Recognition is the title of an editorial in the March issue of *Canadian Chemistry and Metallurgy (Toronto)* calling attention to the difference between official recognition given professional and industrial chemical societies in Great Britain and Canada.

The British Government consults important national scientific and engineering bodies, and this measure of recognition is helpful to societies and very valuable to governments. Thus responsibility is turned over to societies, and the composition of directing Boards is made much more representative.

But Canadian organizations are, themselves, somewhat to blame, as they have not been competitive in the past with individuals, particularly those associated with universities, who have had very considerable influence, and from whom, it must be said, much service has been received. On the whole, the British system would seem to be rather better, since it is much more representative and secures Boards that reflect, through their composition, the responsibilities of industry and the profession at large, in a way that makes it appear at least that these important groups are coöperating in a democratic way in their own interests and those of the country. Industry and the professions do not so much desire to have services established for them, as they do to work out, in a coöperative way, through government, something that is more an organic part of themselves.

THE Symposium on "The Chemist in Industry: His Induction, Functions, Influence, and Rewards," which was held under the auspices of the Society of Chemical Industry at the Grand Hotel, Manchester, on Friday, April second, was a very successful venture. . . . In summarizing the four papers on the induction and the functions of the chemist in industry, which had been contributed by Dr. J. J. Fox, Professor J. C. Philip, Mr. F. Scholefield, and Mr. C. M. Whittaker, the attention of the meeting was directed to the controversial matters raised by the authors, notably to the type of training which they thought students of chemistry should receive; also to that somewhat indefinable quality termed "personality" which was mentioned in most of the papers. . . . Widely-divergent opinions were expressed on the type of training that should be provided for those students who were to enter the chemical industry; but it was generally agreed that the gap which separated the university from the factory, and the academic chemist from the industrial chemist, should be so bridged as to bring about a close and lasting coöperation between the two.

A few combined reprints of the eight papers are available, and copies may be obtained on application to the General Secretary, Society of Chemical Industry, 46, Finsbury Square, London, E, C. 2.—*Chemistry and Industry, (London).*

DR. A. C. CHIBNALL has had the title of professor of biochemistry in London University conferred upon him in respect of the post held by him at the Imperial College — *Chemical Trade Journal and Chemical Engineer, (London).*

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To give chemists professional solidarity.

To put the profession back of a definite code of ethics.

To insist on adequate training and experience qualifications.

To educate the public to an understanding of what a chemist is.

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HOWARD S. NEIMAN, *Secretary*
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